

*Full Length Research Paper*

# Prospects and potentials of Kakum Conservation Area, Ghana

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The Kakum Conservation Area (KCA) is a protected remnant semi-deciduous forest of Ghana's fast dwindling portion of the Upper Guinea Forest. The prospects and potentials for sustainable conservation and their challenges were the main concern of this study; that is whether there is the opportunity for KCA to increase tourism drive as a means of ensuring self-funding for sustainable conservation in the long term. In this paper, we highlight the main features of KCA that present enviable opportunity to promote tourism and increase internal-generating funds as well as appealing to donor sources, and set it apart as one of the most successful attempts at management, protection and conservation of biodiversity in a developing country. We adopted a thorough search and used an analytical - descriptive approach to provide information. We found that although only a small portion of the KCA is primary and a greater portion remains secondary because of logging records, KCA contains great faunal diversity including charismatic ones that attract tourists, hundreds of herbaceous plants and woody plant species and various sceneries including the "big tree", which altogether hold great potential for being an enviable tourist attraction. Revenue generated internally, mainly from tourism, from 2006 to 2010 showed a positive trend that predicted a rise in revenue in future years, especially when the conservation area is marketed appropriately. However, we found need for an intervention from the donor world in view of the high cost of initial investment in infrastructural development; we are sure that promoted tourism will increase internal-generating funds to make KCA self-funding subsequently.

**Key words:** Kakum Conservation Area (KCA), big tree, canopy walk-way, hiking, observation platform, rainforest, tourism, virgin forest, waterfalls, self-funding, donor sources,.

## INTRODUCTION

Without doubt, biodiversity is under threat globally (Smith and Walpole, 2005); and almost all countries have set aside areas for conservation of species (Cullen and White, 2013). With over 180 countries being signatories to the International Convention on Biological Diversity (UNEP, 1992), now it is the means of attaining conservation of biodiversity that is the preoccupation of

policy makers (Gadgil, 1992; Terborgh et al., 2002). The designation and management of protected areas have become principal elements in the development planning of many nations (Pimbert and Pretty, 1997). But whereas the concept of protected areas has existed in Europe for several thousand years (Jones-Walters and Čivić, 2013), the concept seems quite recent in tropical Africa.

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For example by 1967 Ghana had 13 wildlife reserves comprising five National Parks (with emphasis on tourism), one strict Nature Reserve (with emphasis on research), five Game Production Reserves (with emphasis on meat production and multiple land use programmes); and two Wildlife Sanctuaries (with emphasis on education and research) (Manu, 1984). After various re-organizations and necessary arrangements, Ghana currently has 16 Wildlife Protected Areas (WPAs) comprising seven National Parks, six Resource Reserves, two Wildlife Sanctuaries and one Strict Nature Reserve. Collectively, the WPAs total about 12,585 km<sup>2</sup> that is, about 5.5% (Jachmann, 2008) of the country's nearly 239,000 km<sup>2</sup> land area. In addition, there are five coastal wetlands (Ramsar Sites) and about 300 scattered forest reserves. In all the protected areas, comprising the forest reserves, WPAs and wetlands represent about 16% of Ghana's total land area. The official WPAs of Ghana are generally modeled on the Yellowstone Park of Category II of IUCN classification (Mckinnon and Thorsell, 1986) in which the usual practice is to greatly restrict extractive human activity to the point of complete halt with the exception of tourism and research.

The wildlife protected areas are managed by the Wildlife Division; one of the four arms under the Forestry Commission, which was previously known as Game and Wildlife until 1994 and Wildlife Department later on. Ghana, formerly called Gold Coast, gained its political independence from British colonial rule in 1957. Before then, the desire to exert sustainable trade supremacy over other European competitors urged the British to set aside some forests for logging as the indigenes cleared the land to cultivate cash crops such as oil palm and cocoa; and food crops e.g. maize and cassava. Towards the end of the 19<sup>th</sup> century, the then Kakum Forest was among the various reserves set aside as the "*Celtis-Lophira* hardwood Ghana's Production Resource Reserve". However the boundaries were not demarcated until 1925. In 1940 the Assin Attandanso forest was added to make a total of about 400 km<sup>2</sup>. Timber exploitation especially of *Khayaivorensis* (mahogany) escalated from the 1950s until 1989 when the reserve was placed under Ghana Wildlife Department (GWD) to extend emphasis on protection and conservation beyond the trees to cover wild animals. Over the years several laws e.g. the 1961 Wild Animals Preservation Act and the legislative Amendments of 1971 had to be passed to make the existence of the Park a reality. The KCA was finally gazetted as a national park and resource reserve by Legislative Instrument 1525 of 1992 under the administrative jurisdiction of the GWD. By that time there had been reduction in the size of the original 400 km<sup>2</sup> due to unauthorized encroachment by farmers over the years when various legal arrangements were being made to wrestle the area out of Ghana's complex land tenure system. Now, known as a conservation area, Kakum combines the national park with the hitherto Assin

Attandanso resource reserve (Jachmann et al., 2011).

Historically the indigenes have been generally and heavily dependent on forests for their livelihood. Apart from clearing the land for subsistence farming and cash crops, forest products have provided fuel, food including bush meat, medicinal herbs, and raw materials for construction of houses, furniture and many other items. On the other hand, the current status of KCA has been achieved through the combined efforts of the Government of Ghana, United Nations Development Programme (UNDP), United States Agency for International Development (USAID) supported by Central Region Development Commission (CEDECOM), Conservation International (CI), Mid-West Universities Consortium for International Activities (MUCIA) and Shell Company Ghana Ltd. Even though much more financial support is required, it cannot be overemphasized that positive attempts were made to keep KCA in undisturbed state as much as possible. Undeniably, the KCA is a remnant of the Upper Guinea Forest which used to be a strip of tropical moist forest that ran parallel to the coast from Guinea to the Cameroons (FAO/ECOWAP, 2005).

Over the last two decades, tourism has increasingly been projected as a key rationale and as an instrument for maintaining protected areas (Balmsford et al., 2009). The challenges on the prospects of KCA, for sustainable conservation of the remnant Upper Guinea Forest in this regard, is a major concern. Against a lot of odds, such as local people's unawareness of the importance of conservation, and being poorly funded, every effort is being made in the KCA to make it one of the most sustainable functional conservation zones in the country. Whether KCA has the potentials for increasing tourism drive as a means of self-funding in the long term is the main concern of this study. Therefore, it is our aim in this paper to highlight the main features of KCA that present enviable opportunity to promote tourism and increase internal-generating funds as well as appealing to donor sources, and set it apart as one of the most successful attempts at management, protection and conservation of biodiversity in a developing country. We have basically used an analytical - descriptive approach to provide information which is expected to sustain interest of the international community and provide an understanding for any call of support from any world conservation institution.

## MATERIALS AND METHODS

### Study area

The 210 km<sup>2</sup> Kakum National Park (KNP) and its twin 150 km<sup>2</sup> Assin Attandanso Resource Reserve (AARR) form the Kakum Conservation Area (KCA) (Figure 1). It spans the TwifoPraso, Assin and Abura districts of the Central Region of Ghana (1°30'N-1°51'N; 5°20'W-5°40'W). It consists of variations of a moist evergreen forest. The KCA protects the headwaters of River Kakum (which is the source of its name) and two rivulets, Obuo and Nemini. Other

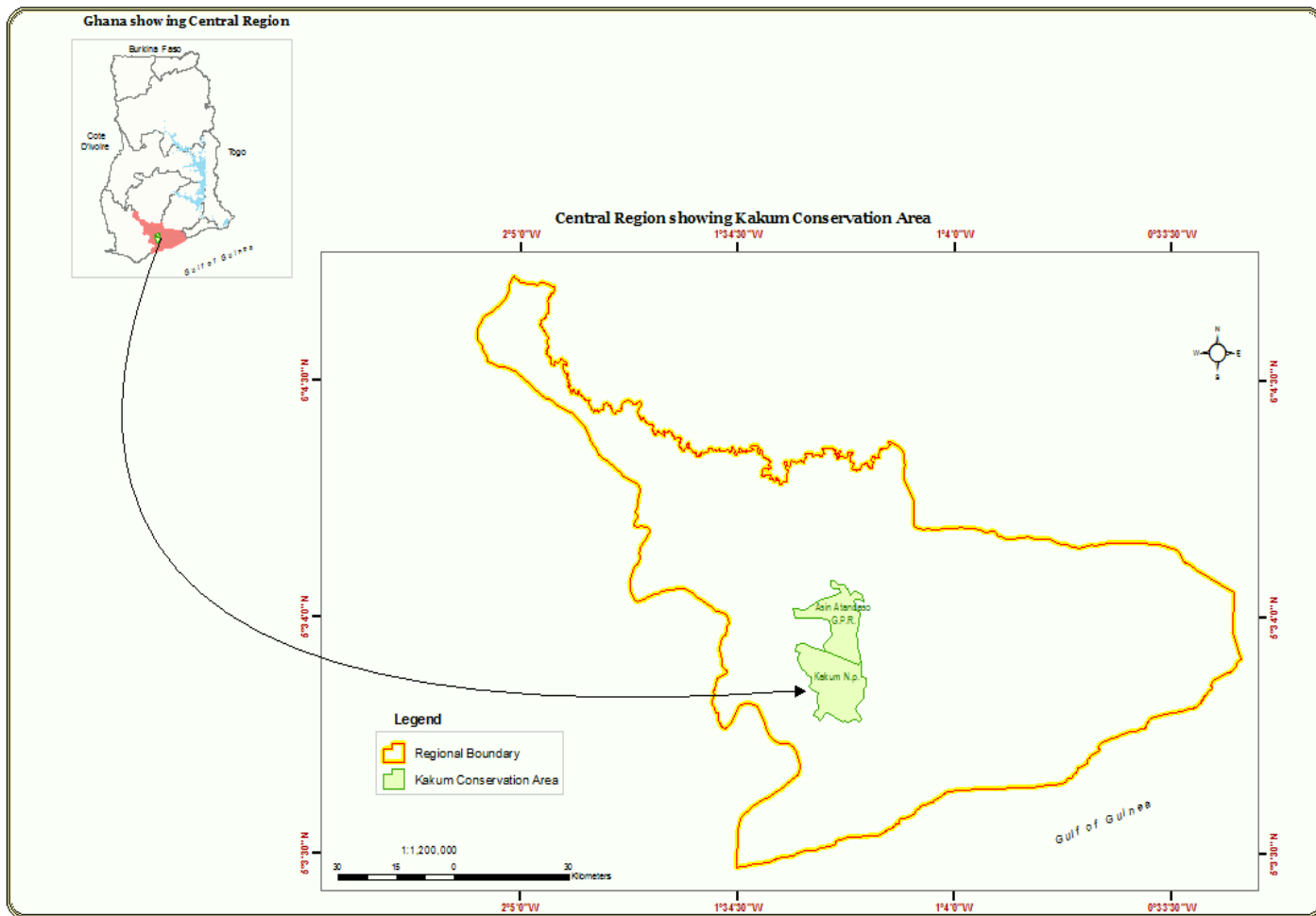


Figure 1. Location map of Kakum Conservation Area in the Central Region of Ghana.

drainage basins are formed from Nchemna which flows out to the south-east towards the sea; and Sukuma and Afia streams flowing west to the River Pra. Some other smaller streams are Ajueso to the east and Benebene and Aboabo to the north which may all dry up at the peak of the dry season in late February to early April. About a kilometer stretch of the main Cape Coast - TwifoPraso road forms part of the southern boundary of the KCA.

The average relative humidity is about 80% while the temperature ranges from 19-32°C. The terrain is flat to slightly undulating with an elevation of between 150-250 m asl (Forestry Commission, 2007), mostly at the south-western portion of the Park.

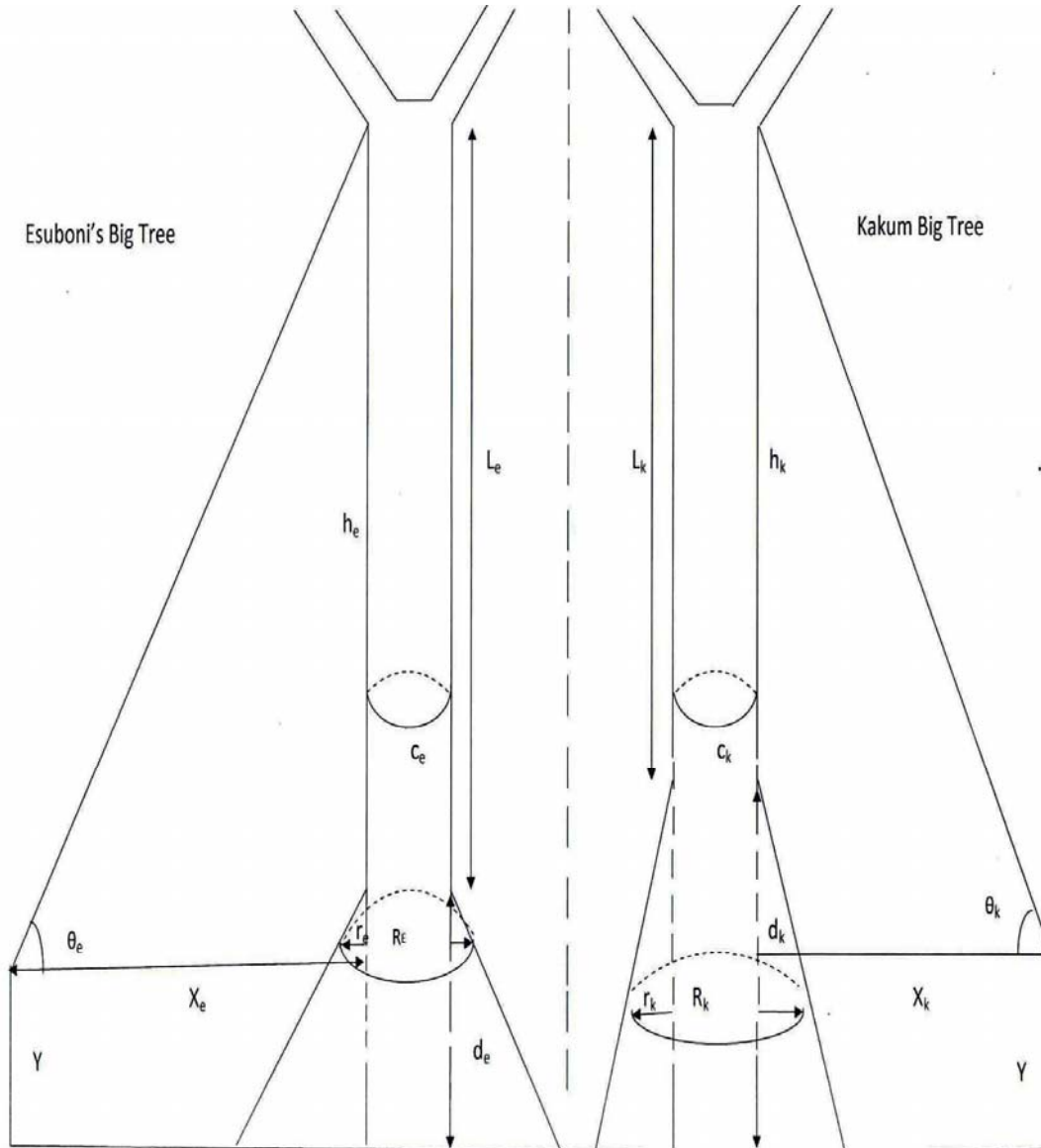
#### Data collection

We used a thorough search method and an analytical - descriptive approach to provide information. A systematic approach was adopted in which evidence was obtained from individual indigenes through interactions and from the grey literature at the Park's headquarters and these were confirmed or otherwise by field survey.

The Area is fringed by about 50 communities and for the field survey, carried out from March 2010 to December 2012, the study area was divided into nine study sites, Abrafo, Kruwa, Briscoe II,

Adiembra, Homaho, Aboabo, Afiaso, Antwikwaa and Mfuom all of which are also park posts for guards (Figure 2). The study took into consideration adequate rainy season and dry season months. Some already existing trails were followed usually from 0700-1000 and 1500-1800 GMT to sight any large mammal that may not have been reported. Also, each site was scouted over the period of study in order to locate features that have tourism potential such as sceneries which have not been reported, areas that can be developed for tourists' attraction, and to generate new ideas for boosting up tourism promotion in KCA. Particularly for a confirmation of what may be the biggest tree in Ghana, a tape and a SUUNTO height meter (Clinometer), were used to measure parameters like circumference, diameter and height of each of two big trees (Figure 3), one at KCA which our study identified and another at the Esuboni Forest Reserve (EFR), near AkimOda in the Eastern Region of Ghana), which hitherto has been dubbed the "Big Tree" and declared from time past to current as the biggest tree in the sub-region for years. Calculation of tree height was based on the formula  $Tan \theta = \text{opposite side } (h) \div \text{adjacent side } (x)$  (Figure 3) and the diameter (D) based on  $C = \Pi D$  where C is the uniform circumference and  $\Pi$  is the constant 3.14. All other statistical analyses were done by using Microsoft excel and PAST (Hammer et al., 2001).

Benefits accrued to KCA from the existing tourism drives and sustainability of such tourists' attractions and corresponding gains,



**Figure 2.** Measurement of height and circumference of big trees at Esuboni Forest Reserve near Akim Oda and Kakum Conservation Area near Cape Coast.

as well as trends of patronage of the various attractions were investigated by obtaining information from Management and analysis were made on available records from the Park's Headquarters. Threats to tourism drive at KCA were also investigated.

**RESULTS AND DISCUSSION**

The study reports some very interesting sceneries that offer potential for tourists' attraction. These include what may now be the biggest tree in Ghana, water falls, virgin forest, canopywalkway and observation platforms (Figure 2). Also included are the charismatic fauna, the jungle itself and its characteristic flora.

*Tieghemella heckelii* in the Esuboni Forest Reserve near AkimOda in the Eastern Region is named "The Big Tree". The impression is that, "The Big Tree" is the biggest tree in Ghana according to the Forest Services Division of the Forestry Commission; by consideration of width uniformity of the trunk between the base and the branches, the height as well as its accessibility. It means that many other trees may be bigger only at the base than "The Big Tree" or may not be high enough for the accolade; or, perhaps, bigger than the "Big Tree" by all standards but not accessible. This tree, located on the AgonaSwedru - AkimOda highway, has attracted many tourists, both local and foreign nationals to the Reserve. This study reveals a bigger tree in the KCA, about 30 km

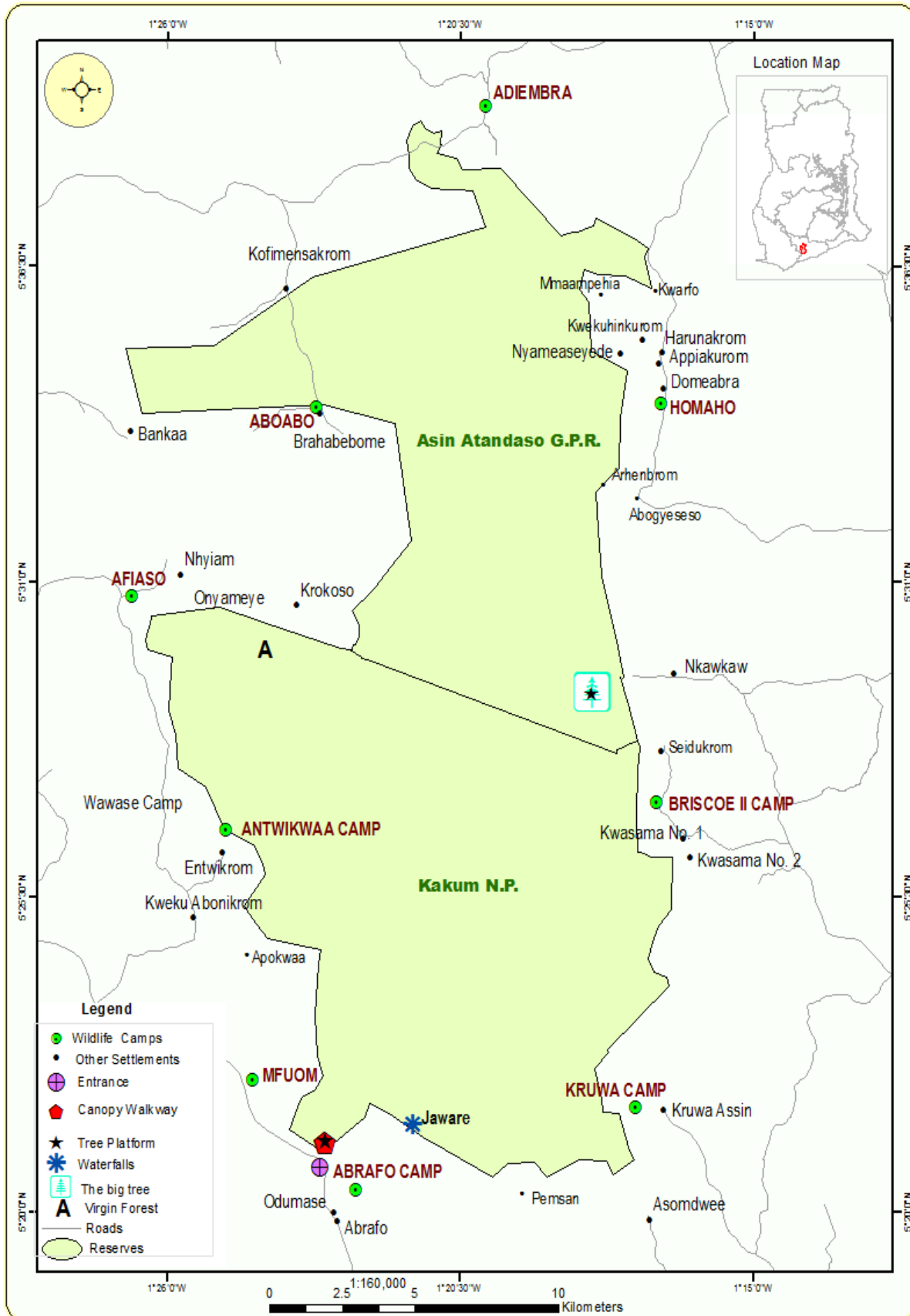


Figure 3. Location map of KCA showing landmarks and special features.

**Table 1.** Comparing parameters- height, circumference and diameter of two big trees.

Parameter	Kakum big tree	Esuboni big tree
Angle (s) of measurement to the point of trunk branching	59 <sup>0</sup> , 84 <sup>0</sup> , 80 <sup>0</sup> , 58 <sup>0</sup>	50 <sup>0</sup>
Distance of measurement from tree (adjacent side, x)	x <sub>k</sub> = 17.6 m, 3.17 m, 5.62 m, 18.4 m	x <sub>e</sub> = 26.8 m
Height of measurement of tree (opposite side, h); average from 4 readings and 1 reading at Kakum and Esuboni Reserves respectively	17.6 m × Tan 59 <sup>0</sup> 3.17 m × Tan 84 <sup>0</sup> 5.62 m × Tan 80 <sup>0</sup> 18.4 m × Tan 58 <sup>0</sup> = h <sub>k</sub> = 30.211 m	26.8 m × Tan 50 <sup>0</sup> = h <sub>e</sub> = 32.026 m
Height of reader's eye level above ground	= 1.52 m	1.52 m
Total height of tree excluding branches	30.211 m + 1.52 = <b>31.73 m</b>	32.026m + 1.52 m = <b>33.55 m</b>
Circumference at breast height, R	R <sub>k</sub> = 12.5 m	R <sub>e</sub> = 11.4 m
Total distance round base-stem extensions at the breast height, Σr	Σr <sub>k</sub> = 4.4 m	Σr <sub>e</sub> = 4.6 m
Uniform circumference of tree, C	12.5 m - 4.4 m = <b>8.1 m</b>	11.4 - 4.6 m = <b>6.8 m</b>
Uniform diameter, D	8.1 ÷ 3.14 = <b>2.6 m</b>	6.8 ÷ 3.14 = <b>2.2 m</b>
Height of tree above ground where uniform circumference begins	d <sub>k</sub> = 8.2 m	d <sub>e</sub> = 2.3 m
Length of Uniform circumference	L <sub>k</sub> = 31.73 - 8.2 = <b>23.53 m</b>	L <sub>e</sub> = 33.55 - 2.3m = <b>31.25 m</b>

from Cape Coast, which is 12.5 m wide at the base and 8.1 m wide at the trunk and thus about 1.1 m wider at the base and 1.3 m wider at the trunk than the hitherto “Big Tree” (Table 1). The two big trees measured impressive 2.6 and 2.2 m uniform diameter at KCA and Esuboni Forest Reserve (EFR), respectively (Table 1). It is only for the height that the big tree at EFR is taller, measuring 32.55 m as against 31.73 m (Table 1). At Esuboni the circumference and the diameter of the trunk become uniform for 31.25 m after only about 2.3 m height above ground which gives it a very good look (Figure 4). The sight makes it awesome. On the other hand the big tree at KCA (Figure 5) gives an impression of a beautiful huge tree at the base and its uniform circumference starts at a higher level, that is, 8.2 m from the ground for 23.63 m. Indeed both trees could qualify as “Big Trees” going by the criteria for the biggest tree in the Sub-Region but “who is who” between these two spectacular trees at EFR and KCA favours the latter. Foeline (1998), in excitement and ecstasy about the “Big Tree” at EFR near AkimOda quoted 396 cm (3.96 m) as its diameter and 90 m as its height though the newsletter did not indicate its methods

of measurement. However, if one could imagine the speed of a sprinter to complete a 100 m race in about 10 s, it would be understandable as to how awesome the height of this tree only 10 m less is and with such a diameter. Though our study recorded a height of only a third of Foeline (1998) we are sure that our methodology is sound enough for an accurate estimate which height is still awesome to behold. In any case, the big tree at KCA is also *T. heckelii* and it is located at the Briscoe II area, approximately 3 km away from the nearest accessible village, i.e. Seidukrom (Figure 2). If one accesses the tree from another village, that is, Nkawkwawit cuts down the walking journey to a shorter walking duration of about one hour.

It appears that the *T. heckelii* tree has the habit of growing big, high and uniformly wide along the trunk. The implication of this observation is not by way of toppling the recognition status of “The Big Tree” in the EFR and in consequence divert attraction to the newly found big tree at KCA, but to give tourists cause for comparison between the two by visiting both sites; to draw more tourists to KCA; to draw attention to the importance of



**Figure 4.** The big tree at Esuboni Forest Reserve, near Akim Oda.



**Figure 5.** The big tree at Kakum Conservation Area, near Cape Coast.

conservation viz-a-viz tree felling as many areas of the country have the opportunity for sighting big trees for sustained tourism drive in future; and to promote the autecology of *T. heckelii*. The occurrence of the big tree wherever in the country will attract tourists just the way each of the numerous waterfalls in the country have substantially good tourists' visitation.

The study also identified, at the Abrafo area, two water formations that appear like falls, and could attract tourists in their own fashionable ways but unlike any of the many popular waterfalls in Ghana. It is contended that the formation must be properly described and accorded the proper landmark formation for the necessary viewing. A proper classification may attract tourists to yield some income to Management. Perhaps local tourists will be more curious to see it as another form of spring water.

According to Management small pockets of primeval forest remain, at the KNP, as remnants of original forest being salvaged by timely adoption of the area as a National Park and continuous stewardship that has prevented further degradation of the area from various anti-conservation practices. The largest of these is what has been called "Virgin Forest" located in the Afiaso area (Figure 2). It covers a land area of 10,782.71 m<sup>2</sup> with a perimeter of 0.522 km according to our latest research (*in prep*). The small size of this Virgin Forest is an index of how heavy logging occurred at KCA. The spate of forest degradation that started several years ago makes primeval forests rare and amazing scenery today; albeit small as it may seem. Ecotourists especially visit places for three reasons; namely: wildlife, scenery and culture. This Virgin Forest will be attractive to many tourists if it is given proper exposure. The comfort of the micro-climate and the quest to satisfy one's curiosity about the rare Virgin Forest will make it attractive to tourists and also students and teachers.

The occurrence of about 69 species of mammals including large mammals like the *Loxodonta africana*, *Tragelaphus eurycerus*, *Hylochoerus meinertzhageni*, *Potamochoerus porcus* and some primate species (Sam, 1996) and about 234 species of birds (Dowsett-Lemaire and Dowsett, 2005) add to the attraction of KCA to both local and foreign tourists for hiking. However, the study found that the Conservation Area is not developed very well to enhance viewing of mammals and bird watching. Yet the potential for such facilities were observable. An observation platform each is located at Abrafo, Briscoe II (Figure 6) and Kruwa areas of KCA. Apart from the Kruwa's platform which needs rehabilitation, the others have been very useful for animal viewing. The Briscoe II platform was erected for viewing *L. africana* taking advantage of the proximity of the big *T. heckelii* which produces large quantities of fruits seasonally. *L. africana* in KCA have special preference to the *T. heckelii* fruit as food as we observed in another study currently in review.

The headquarters of the Area is situated in the south-western corner of the Park; about two kilometers from

Abrafo-Odumase and 30 km from Cape Coast. The Area is sited about 165 km west of Accra, the national capital and therefore could be reached within a three-hour drive. Intercity transport to Cape Coast from Accra (140 km) is available from where one may hire a taxi or join public transport to the Area. From about one kilometer on the Abrafo-TwifoPraso road a 500 m branch road takes one through the main gate to the Visitor Centre. The Museum at the Centre consists of wooden African style buildings which serve as cultural attraction. Here visitors can get information about cultural and medicinal uses of the forest's vegetation. Visitors are educated about wildlife and conservation in general by paintings and posters which explain the complexity and web of life in a tropical forest. The sustainable use of wildlife, the economic and cultural connections that people have with the wild is emphasized during educational talks. An experience of the exhibits prepares the visitor for a reality of the scents, sights and sound of the forest community later. The canopy walk-way (Figure 7) is the most attractive component of KCA now and offers the only aerial walkway through the treetops in Africa. A journey along the 30 m suspended above ground canopy walk-way gives a bird's eye view and is another good opportunity for monkey-viewing and bird watching in addition to the experience and euphoria that make excitement. Three platforms on the canopy walkway serve as observation points for viewing the rainforest.

Considering the size of KCA, increase in number of viewing platform would be necessary to boost tourism and especially so by erecting one purposely for the viewing of the charismatic *T. eurycerus* and also for others like the *P. porcus* and the *H. meinertzhageni*. We propose in our latest study at KCA (*in prep*) for a research on habitat variability to be considered as it will help Management in monitoring and managing some animals well. We find that knowledge of habitat variability and habitat preferences of mammals can help identify appropriate locations for the erection of observation platforms to improve upon successes of hiking tourism in KCA, especially for those mammals that are secretive. It will also inform Management as to where access trails will be needed for the purposes of tourism and research.

Observation platforms near river bodies are expected to contribute to hiking successes in the dry season as mammals are viewed when they come to drink from the streams. Scats and spoors of most mammals are observable around river bodies. *P. porcus* is naturally distributed along rivers and streams and in marshes in the forest while *L. africana* need to drink large quantities of water and cool their bodies with water baths. However, the distribution of most mammals in the rainforest are naturally not very much influenced by water bodies even in the dry season since they obtain fresh succulent food materials throughout the year and can afford long distance locations to drink water. Moreover, while the nocturnal mammals can drink from the streams at night,





**Figure 6.** Observation platform at the Briscoe II area of Kakum Conservation Area near the big tree.



**Figure 7.** Students of University of Cape Coast enjoying the canopy walk-way at Kakum Conservation Area, near Cape Coast.



**Figure 8.** Some of the likely encounters and attractive scenes on your way to the big tree at Kakum conservation area.

secretive mammals like *T. eurycerus* will prefer to drink very early in the morning and all these can elude the observation of a tourist. What this means is that viewing mammals along river bodies in KCA is by chance or by determination to stay long in a hideout in the comfort of an observation platform. Hilly areas can also be developed in ways that will suit bird watching without serious disturbances to the ecosystem.

The boundary between the two reserves, KNP and AARR exists as a trail linking Briscoe II and Afiaso areas (Figure 2) and named “dividing line”. This dividing line can be constructed to make KCA motorable to facilitate deployment of staff and to commute visitors and researchers. It would be interesting for Management to establish another entrance to KCA. The Briscoe II area, occurring at one end of the dividing line, and considering the location of the big tree, seasonal visits to the area by elephants and presence of an observation platform, would be most ideal for a new entrance point to the Conservation Area. This will give tourists the opportunity to start from one end of KCA to the other and to enjoy other sceneries. Some tourists might not want to revisit the old recreational areas of KCA again but might wish to revisit the Conservation Area for new sceneries.

Our study found that the Conservation Area would be useful for field studies by pupils and students and their teachers alike. Our journey from the Briscoe II camp to the Big Tree started from a nearby settlement, Seidukrom, where we parked our vehicle and ended after a 2.67 km slow and gentle walk. After a 1 km-walk from Seidukrom we got to the boundary line and entered the Conservation Area. We covered a distance of 1.67 km between the boundary line and the Big Tree. Buttress roots, prop roots, stranglers and their dead hosts, stranglers and their living hosts, lianas, epiphytes, climbers, epiphylls, drip tips and many more field practical related to plant morphology and ecology were observable even by the path. The occurrence of a big

and beautiful *Milicia excelsa*, with a uniform circumference from the ground, measuring 3 m is particularly refreshing to see. The lucrative tree species has been logged severely and a big one like this is rare today. One prop root formation was especially spectacular (Figure 8). Snails (Figure 8) were encountered even in the dry season and some mammalian activities were also observable.

Available records indicate very high patronage of KCA by tourists of both local and foreign nationals and these tourists mainly visit to experience a walk over canopies of trees along the canopy walk-way or for a hiking experience deep inside the Conservation Area to view fauna, forest structure or for the joy, pleasure and experience of being in a cool rare rainforest. Not much was in the records for camping visitations. In all a total of 455,886 tourists (Table 2) comprising 348,452 Ghanaians (Table 3) and 107,434 foreigners (Table 4) visited KCA for the past 5 years from 2006 to 2010. The study revealed that for the past five years Ghanaian students recorded the highest frequency of visit of 32.7% of all the visits and Ghanaian children/ pupils follow with 28%; 15.8% by Ghanaian adults; 11.3% by adult foreigners; 10.9% by adult students and 1.4% by foreign children (Figure 9). There was no significant difference among the age categories of visitors ( $H=5.82$ ,  $p=0.548$ ) and thus all of the age categories should be given equal target status to market the Conservation Area for improved tourism. The canopy walk-way attracted far more tourists than hiking. The number of visitors to the site in all the months differed from one year to another (Kruskal-Wallis:  $Hs=43.81$ ,  $p<0.0001$ ) but the trend showed visitations were encouraging throughout the year and progressive over the 5 year period studied, barring few anomalies (Figure 10), and that seem to suggest high expectations in 2011 and subsequent years. The two peaks realized in March/April and December (Table 2) which coincide with Easter and Christmas festivities and troughs in May and

**Table 2.** Monthly visitations to KCA recorded over the last 5 years.

Month	Year					Total
	2006	2007	2008	2009	2010	
January	2407	4207	4303	7790	7164	25871
February	3285	4283	3987	8543	10572	30670
March	6804	5533	7422	16252	10697	46708
April	8493	3110	8668	12652	15220	48143
May	6346	5639	9173	11351	3108	35617
June	6982	7500	6527	8054	7351	36414
July	4510	9520	14458	16154	10055	54697
August	4019	6506	13888	12750	8589	45752
September	4957	3031	5403	7076	5958	26425
October	2607	4823	5331	8328	3235	24324
November	3385	3695	9239	11191	4498	32008
December	10039	8091	8463	14356	8308	49257
Total	63834	65938	96862	134497	94755	<b>455886</b>

**Table 3.** Number of tourists (Ghanaians) that visited KCA for the past 5 years.

Year	Total visitation	Adult			Student			Children/Pupil		
		Canopy walk	Hiking	Subtotal	Canopy walk	Hiking	Subtotal	canopy walk	Hiking	Subtotal
2006	45150	11241	59	11300	14221	3160	17381	15688	781	16469
2007	46068	10503	58	10561	15999	746	16745	17959	803	18762
2008	73196	15940	223	16163	24325	625	24950	30807	1276	32083
2009	107035	22973	176	23149	38996	375	39371	43670	845	44515
2010	77003	10495	259	10754	49522	989	50511	15523	215	15738
Total	<b>348452</b>	71152	775	71927	143063	5895	148958	123647	3920	127567

**Table 4.** Number of tourists (foreign nationals) that visited KCA for the past 5 years.

Year	Total visitation	Adult			Student			Children/Pupil		
		Canopy walk	Hiking	Subtotal	Canopy walk	Hiking	Subtotal	Canopy walk	Hiking	Subtotal
2006	18684	8985	338	9323	7863	163	8026	1326	9	1335
2007	19870	9168	173	9341	9111	306	9417	1066	46	1112
2008	23666	10544	533	11077	10167	571	10738	1581	270	1851
2009	27462	13523	624	14147	11135	602	11737	1528	50	1578
2010	17752	7187	446	7633	8854	753	9607	512	0	512
Total	<b>107,434</b>	49,407	2,114	51,521	47,130	2,395	49,525	6,013	375	6,388

January (Table 2) that follow the festive months respectively probably portray the effect of the two festivals on recreation and tourism trends in Ghana. These are the two major festivals in Ghana for ages and they present Ghana good holidays that are ideal for well planned activities including tours to various sceneries and celebrations in ways at various places including tourists' sites that largely contrast the essence of the festivals.

People can afford to spend during Easter and Christmas and often entertainment and recreational centres take advantage of this and advertise their centres in this regard. We are hopeful that Management can increase revenue respectably during annual Easter and Christmas festivities and other national holidays with effective marketing strategies.

The study observed also that visitation to KCA is

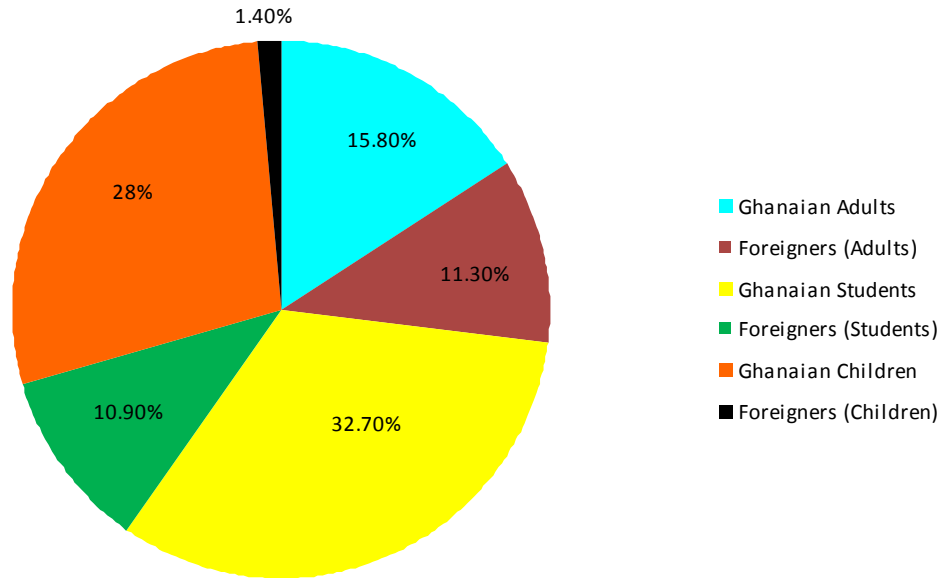


Figure 9. Categories of tourists and their visitations to KCA for the past 5 years.

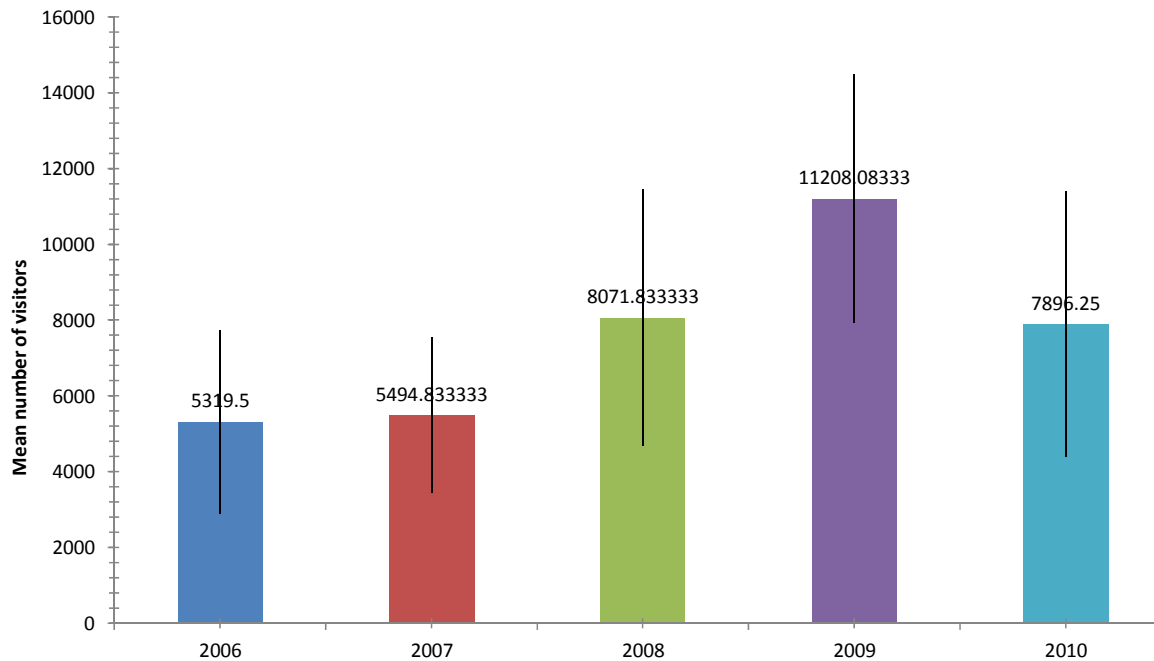


Figure 10. Mean number of visitors per each year from 2006 to 2010 with error bars showing standard deviations.

somehow reduced during the rainy seasons in May-June and September-October. Exception to this in 2006 is due to a shift in the weather pattern in Ghana, which has been erratic in some years; but the figures recorded during the rainy season still point to high attendance that defies the rains somehow.

A positive correlation emerged ( $r=0.7$ ,  $p=0.188$ ;  $y = -13547x + 60000$ ,  $R^2 = 0.849$ ) to indicate that the higher

the number of visitors the higher the revenue. Revenue has been progressive over the five years studied (Figure 11) and this makes expectation for higher revenue in 2011 and subsequent years plausible and lends itself to credible forecast into the future for high revenues in the face of new attractive tourists' sites that have been unraveled by this study and Management cannot afford to disregard the recommendations and suggestions by this

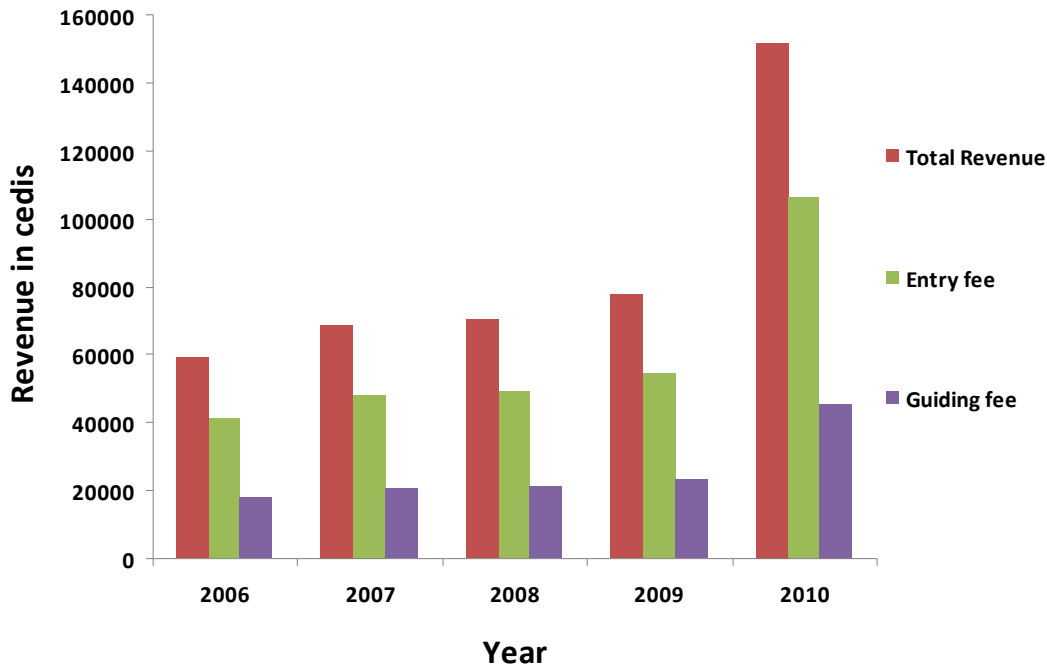


Figure 11. Yearly revenue from tourism at KCA for the past five years.

study. However, one wonders if all these infrastructure lined up by this study can be afforded without external aids considering their total capital requirement in relation to the total annual revenue obtainable from KCA as internal generating fund. How else will threats to tourism in KCA be addressed without funds. Human-wildlife conflicts, especially those from elephant raids (Monney et al., 2010) and poaching remain the major threats to tourism development at KCA. Occasional gunshots heard in the Conservation Area pose risks to visitors.

## CONCLUSIONS AND RECOMMENDATIONS

In the light of the above, KCA has the potential to promote ecotourism that in the long term can ensure self-funding for sustainable conservation. However, for rapid results, this may require some initial investment to supplement internal-generating funds for some infrastructural development; and this is an appeal to the donor world. We recommend that a more serious effort to market KCA should be considered targeting both workers and students; and adults and children. All suggestions made earlier should also be considered. Management is entreated to find lasting solution to the major threats to tourism development at KCA identified by this study.

## Conflict of interests

The author(s) have not declared any conflict of interests.

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