



The Nexus of Traditional Ecological Knowledge and Ecotourism Development: A Case of Bobiri Forest and Butterfly Sanctuary, Ghana

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Abstract

This study focused on the nexus of ecotourism and traditional or local ecological knowledge at the Bobiri Forest and Butterfly Sanctuary in Ghana., The paper argues that although ecotourism needs specific personnel and tangible facilities, ecotourism is a complex phenomenon, which needs a multi-stakeholder approach embedded within the appropriation of traditional ecological knowledge enhanced by religion and customs for sustainability. The study employed a mixed-method approach. The study relied largely on primary data. The target population involved the Kubease community and the management staff of the Sanctuary. In total, 115 semi-structured questionnaires were administered to selected residents from the Kubease community near the Sanctuary. There was also a qualitative study which involved a focus group discussion. The focus group discussion involved eight individuals including the manager of the Sanctuary and seven individuals from the Kubease community in order to provide more data on the local ecological knowledge on the forest. The data from the questionnaires were analysed using descriptive and inferential statistics with the aid of SPSS Version 16. The study also employed thematic analysis for the qualitative data. Recommendations have been devised in order to create fusion knowledge that may increase the visitor experience at the Sanctuary.

Keywords: Ecotourism, Traditional Ecological Knowledge, religion and custom, Bobiri Forest and Butterfly Sanctuary, Ghana.

Introduction

Increasingly, the need to explore alternative approaches to sustainable development is being considered in literature and in practice (Butler and Waud, 1990; Akama and Kieti, 2007; Fennell,



2008; Honey, 2008; Yeboah, 2013). Ghana has embarked on ecotourism development as an approach for providing alternative livelihood especially at the local community level as well as contributing to biodiversity conservation (Owusu, 2001; Yeboah, 2013). The country has endorsed the Conservation of Biodiversity, and through Legislative Instrument 282, 15 wildlife protected areas and forest reserves were declared (Eshun, 2011). Ghana seeks to position itself as an ecotourism hub based on its unique natural endowment. Unsurprisingly, ecotourism in Ghana is receiving consistent research attention such as for example: 'Socio-economic impacts of ecotourism' (Eshun and Page, 2013; Yeboah, 2013; Eshun et al., 2014; Eshun et al., 2015), 'ecotourism resources' (Owusu, 2001; Attuquayefio and Gyampoh, 2010; Eshun et al., 2014; Eshun and Tonto, 2014) and 'econometric applications' (Narud and Vondolia, 2005). However, most of the ecotourism research, has focused on ecotourism potential in the Central Region of Ghana, while other regions are yet to receive similar needed attention. This study thus focuses on the Bobiri Forest Reserve and Butterfly Sanctuary (BFRBS) in the Ashanti Region towards bridging this gap in literature.

The BFRBS is the leading butterfly sanctuary in Ghana and remains a hidden jewel to most ecotourists who visit the country. Another consideration worth noticing from the outset is that, despite the laudable contribution to ecotourism literature attention to traditional ecological knowledge (TEK) is almost none-existent (Eshun, 2011; Zapata et al., 2011). TEK is used interchangeably with indigenous technical knowledge, ethno-botanical knowledge, local ecological knowledge and technological knowledge (Dei, 2000; Chao and Hsu, 2011). Some researchers argue that the application of TEK in ecotourism can contribute to sustainable development of tourist destinations (Rajasekaran, 1993; Leach and Mearns, 1995; Milazi, 1996; Yli-Pelkonen and Khol 2005; Wanga et al., 2013).

Many others have argued that TEK can significantly market ecotourism destinations and contribute to customer satisfaction (Johnston, 2000). This study thus seeks to unravel the depth of TEK at BFRBS, on some of its mostly floral species. Eshun (2011) shows that TEK can contribute to carving out a unique selling proposition at ecotourism destinations especially in Africa, by offering to tourists the opportunity to have a feel of the worldviews of indigenous people. Thus, the attempt at bridging this glaring lacuna is to anchor the premise that TEKs can contribute to visitor experience, and *a priori* engender repeat visit to ecotourism sites especially in Africa where oral culture is still common.

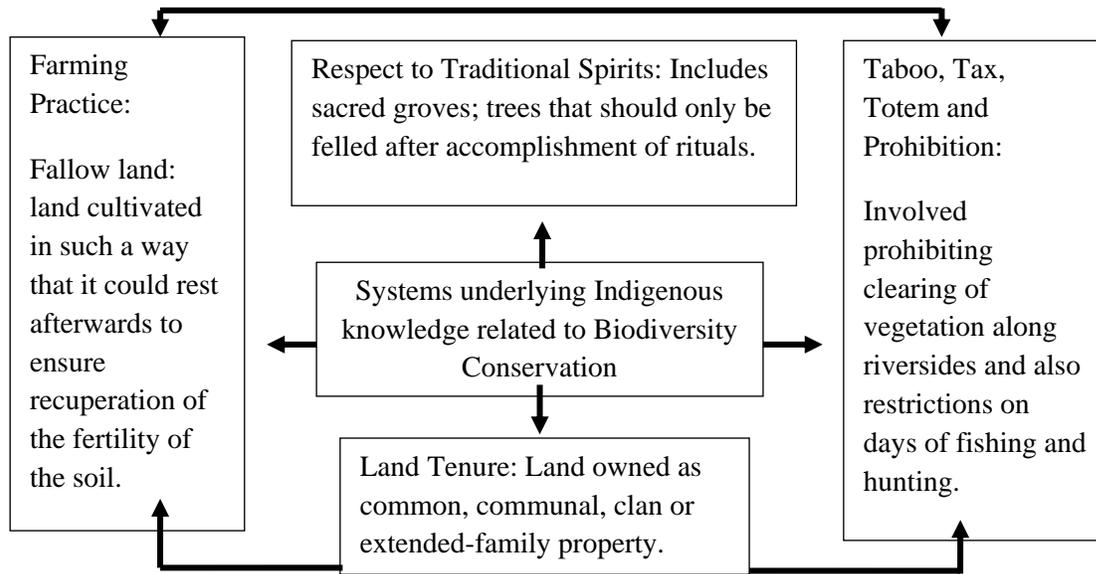
Literature Review

The TEK in Africa is underpinned by four management strategies. First, the pre-colonial management of land use revolved around what can be loosely termed as 'core, buffer and transitional zones' (Campbell, 2004). A core zone was a highly protected area of a forest and was only entered during ceremonial or ritual activities. A buffer zone allowed for limited use of resources, and a surrounding transitional zone allowed for farming and logging and this was managed in an ecologically 'sustainable' way.

However, the people-out viewpoint of colonial conservation abrogated this fluid relationship of the natives to their environments (Eshun, 2011). Indeed, colonialism underpinned by reductionism at the core of the natural sciences, formalised differences between land use, forestry and wildlife conservation in most African societies (Leach and Mearns, 1995; Hens, 2006; Mensah-Sarfo and Oduro, 2011). Amanor (2003) has argued strongly that the pre-colonial systems that ensured

conservation of wildlife and trees were not primitive, in fact in many cases they championed sustainable natural resource use.

Figure 1 Systems Underlying Indigenous Conservation in Ghana



Source: Modified from Hens (2006: 25).

This observation was enshrined in the usufructuary standpoint on land tenure, which ensured that for the ‘common good’ of a clan and individual to whom a parcel of land was given took great care to protect it (Amanor, 1999). The second important aspect of TEK that encouraged wildlife conservation involved religious beliefs and practices including prohibitions, taxes, taboos and totems. The killing of pregnant animals was for example, religiously prohibited. This religious mechanism ensures that specific species of animals were conserved during the closed seasons (probable periods of gestations of wildlife, usually from June to September). The imposition of taxes was associated with kills of such animals as bongo (*Tragelaphus eurycerus*), bushbuck (*Tragelaphus scriptus*) and red river hog (*Potamochoerus porcus*). As expected in religio-customary practices hunters were required to send the hind legs of their kill to the chief of the village as a form of tax. As a consequence, the tax on killing big animals discouraged some hunters and contributed to their conservation (Hens, 2006). There has been a long holistic interaction between people and their environment (Oduro and Mensah-Sarong, 2011). Before colonialism, totemic relationships ensured that some trees and animals were strong *inter alia* elephant (*Loxodonta spp*), birds such as parrot (*Psittacus spp*) and raven (*Corvus spp*), are totems for the *Anona* and the *Asona* clans of the Akans, respectively. In Akan religion and custom, the notion of *Tumi* (supernatural powers), that *Onyame* (the Supreme Creator) imbues an inanimate resource like rocks, rivers, streams, stones and living resources like trees, animals as well as humans (Hawthorne and Abu-Juam, 1995). Examples of spirits engendering conservation are epitomised by sacred groves. Sacred groves are usually: “partially or fully protected by local religious and/or cultural agents” (Okoti 2006: 23). Ghana has 1904 sacred groves ranging in size from 0.5 to 1300 ha— all inexorably embedded in reverence to spirits (Campbell, 2004).



Currently, there are international declarations and conventions that advocate for some of these indigenous knowledge systems to be regarded in biodiversity conservation initiatives, such as ILO Convention Number 169 on Indigenous and Tribal People, Programme of Action for Sustainable Development of the Agenda 21, International Tropical Timber Organisation (ITTO) Guideline for the Sustainable Management of Natural Tropical Forest, Chapter of the Indigenous—Tribal People of the Tropical Forests, Convention on Biodiversity and the Oslo Statement on Ecotourism (Owusu, 2001). Ghana has endorsed many of the international inputs in planning of national forest policies and laws and also to ensure that indigenous and tribal peoples benefit from conservation and development initiatives (see Table 1).

Table 1 Ghana's Signatory to Conservation-Related Conventions

Conservation-Related Conventions	Date
Convention on the Africa Migratory Locust.	25 th May 1962.
International Convention for the Conservation of Atlantic Tunas.	4 th May 1966.
Abidjan Convention on the Conservation Nature and Natural Resources.	15 th September 1968.
Treaty and Prohibition of the Emplacement of Nuclear Weapons of Mass Destruction on the Seabed and the Ocean Floor and in the Subsoil Thereof.	11 th January 1971.
Convention on Wetlands of International Importance, especially at Waterfowl Habitat.	2 nd February 1971.
Convention Concerning the Protection: the World Cultural and Natural Heritage.	16 th November 1972.
Convention on International Trade in Endangered Species of Wild Fauna and Flora.	3 rd March 1973.
Convention on the Military or Any other Hostile Use of the Environmental Modification Techniques.	10 th December 1976.
Convention on the Conservation of Migratory Species of Wild Animals.	23 rd June 1979.
Convention on Biological Diversity.	June 1992.

Source: Ministry of Science and Technology (2002:27)

The key wildlife policy in Ghana at the present time is the 1994 Forest and Wildlife Policy (FWP), which are based on the sustainable development paradigm. However, issues of TEK are not overtly articulated in the FWP (Opoku 2006:14).

TEK and Ecotourism Development

There are many terms in use to describe TEK *inter alia* indigenous knowledge, TEK and ecological wisdom. Indigenous knowledge is the actual knowledge of a given population that reflects the experiences based on traditions and includes more recent experiences with modern technologies. Indigenous people, including farmers and rural artisans are the custodians of indigenous knowledge systems. These knowledge systems may appear simple to outsiders but they represent mechanisms to ensure minimal livelihoods for indigenes. Indigenous knowledge systems often are elaborate, and they are adapted to local cultural and environmental conditions and are tuned to the needs of local people and the quality and quantity of available resources (Dei, 2000). They pertain to various cultural norms, social roles, or physical conditions and their efficiency lies in the capacity to adapt to changing circumstances. TEK has been viewed as part of a romantic past, as the major obstacle to development, as a necessary starting point, and as a



critical component of a cultural alternative to modernisation (Dei, 2000).

TEK uses the information, advice and traditional wisdom that have evolved over centuries of living as part of the environment. Such information reflects the common sense and religio-cultural resourcefulness of local people's knowledge concerning the realities of everyday living and it is often referred to as the "knowledge of natural milieu" (Dei, 2000). TEK includes an intimate and detailed knowledge of plants, animals and natural phenomena, the development and use of appropriate technologies for hunting, fishing, forestry and a holistic knowledge or world view which parallels the scientific disciplines of ecology. TEK has been applied to diverse scientific disciplines and it may be particularly useful when managing wildlife populations that occur in remote locations where extensive scientific studies may be impractical. Despite this, wildlife managers and conservation biologists have received TEK skeptically. According to Akama (1996), the dominance of Western environmental values still leads to the creation of parks and nature reserves, which exclude local people from them, only for some of these protected areas to be experienced by foreign tourists. There remains a glaring lacuna on how pre-colonial, colonial forestry and wildlife conservation show continuity in ecotourism in especially Africa. Presently, the community-based ecotourism in Ghana also selects people from the communities to form Tourism Management Committees (TMCs). The TMCs however are immediately faced with two main challenges. First, since colonial conservation privileged 'landowners' and chiefs, there is therefore the tendency to accord them special privileges in ecotourism in Ghana. For example, during the development of the Wechiau Community Hippo Sanctuary, the landowners demanded that the TMCs should be made up of only members from their tribe. Shehab (2011:342-3) confirms a similar case at the Makuteke Contract Park in South Africa, where "there were too many members of the royal family serving on the park's executive body the job opportunities were given to affiliates of -the royal family". Scientific expeditions often involve the local people as guides and nature trail clearers, whilst their knowledge are often ignored. For example, Conservation International sponsored a five-year research project in Ghana; the consortium of researchers only invited the chiefs of the surrounding villages to the closing ceremony. However, an effective local planning must reflect the knowledge foundations of locals.

Knowledge from natural sciences and TEK have their own merits and demerits. For instance, at the Wechiau Community Hippo Sanctuary, an expedition by Earthwatch scientists from 2000-2003 documented over 210 species of plants, about 200 species of birds, 16 species of bats, 26 species of rodents, 13 species of snakes as well as 6 species of amphibians (Eshun and Tagoe-Darko, 2015). Also, the expedition showed that, although plant species such as *Heeria isginis* and *Strychnos spinosa* are rare in Ghana, they are common in the Sanctuary, and thus present an opportunity for ecotourism, since the concept is touted on biodiversity richness and rarity.

Secondly, while these types of scientific expeditions often involve people from the local communities as guides and nature trail clearers, their TEK are often ignored. For example, a consortium of researchers at Kakum Conservation Area only involved the chiefs of the surrounding villages, who were only invited to the closing ceremony (Eshun, 2011).

David Western of the Africa Wildlife Foundation has argued, however, that the use of TEK could increase the attractiveness of protected areas. For example, tourists to parks in Kenya used to spend on average 37 seconds on the baboons and more time on what are referred to as Kenya's 'Big Five'—rhino, lion, buffalo, leopard and elephant. Yet with the use of TEK "tourists are learning more on baboons and spending 2-3 hours" (Eshun and Tagoe-2015). Thus, there is the push for 'fusion knowledge' in ecotourism where plural values, knowledge's and interests of diverse

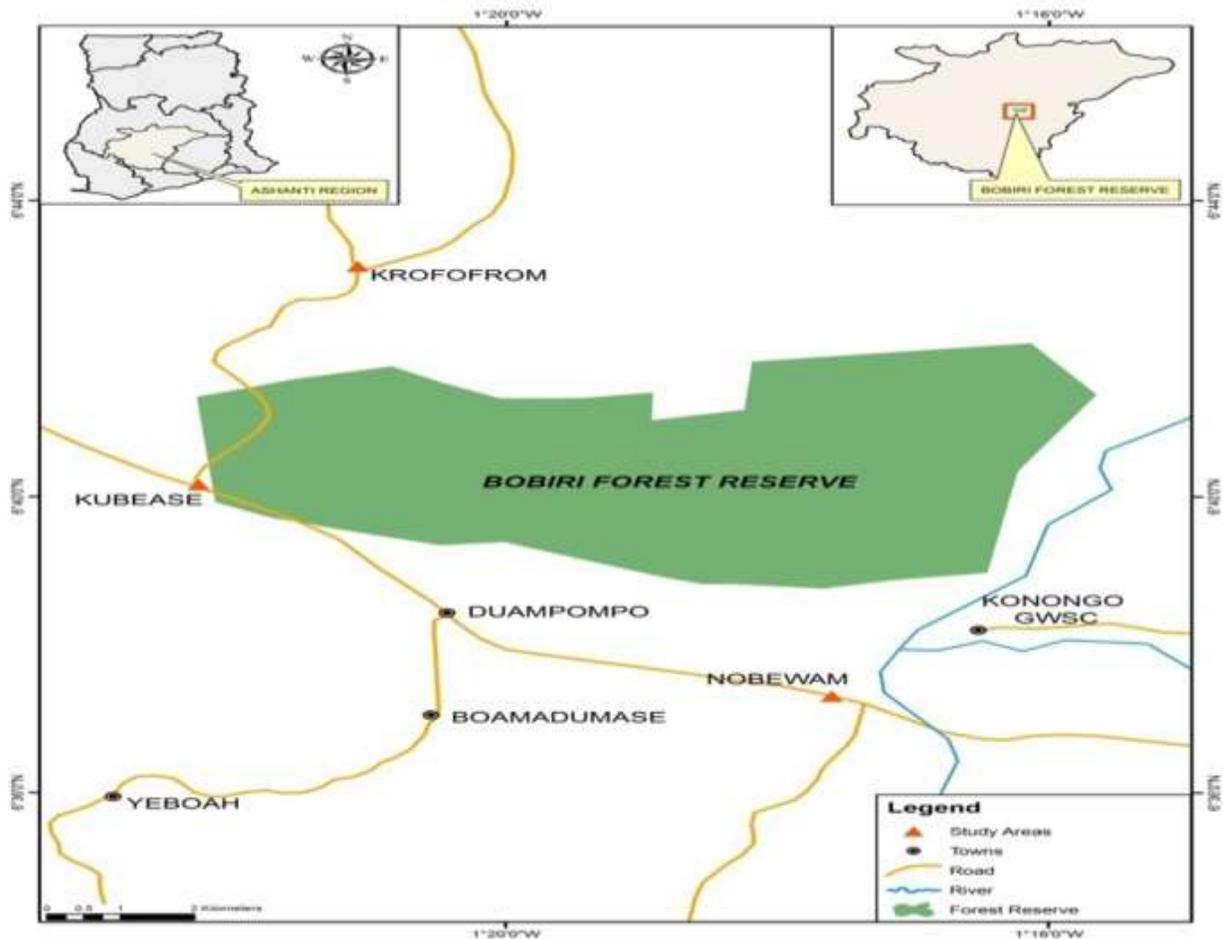
stakeholders are included (Brown 2003). Fusion knowledge seeks to understand and incorporate indigenous uses of 'common pool resources' into the management of eco-sites.

Methodological Approach

Study Area

BFRBS was a reserve gazetted by the government in terms of its administration on 11th February 1949, then by the colonial masters. BFRBS is located about 35 km southeast of Kumasi and about 4km off the main Kumasi-Accra road at the village of Kubease. BFRBS is 25 minutes' drive from Kwame Nkrumah University of Science and Technology and it is one of the Forestry Research Institute of Ghana's (FORIG) Ecotourism Sites. With its lush greenery and mystifying atmosphere, the BFRBS is the largest preserve parcel of land administered by FORIG. It is one of the most beautiful Forest Reserves in West Africa (see Fig. 2).

Fig. 2 Map of BFRBS



Source: G I S Remote Sensing and Cartography Unit, Department of Geography and Regional Planning



The reserve was created in 1939 when it was still an unexploited primary forest. It falls within the Tropical Moist semi-Deciduous Forest Zone (Eshun et al., 2014). The Reserve lies between latitude 60° 40' and 60° 44' North of the Equator and longitudes 10° 15' and 10° 22' West of the Greenwich. The Sanctuary derives its name from a stream called Bobiri, which lies within the reserve. The Reserve hosts the Bobiri Forest Arboretum- with about 100 indigenous species on 1.7ha of land- the BFRBS. BFRBS offers the following: adventure travel; outdoor recreational activities; avenue to learn about the environment; a chance to discover new cultures and locations; environment in which to observe nature; and desire to undertake epistemological studies on nature. BFRBS has a total land area of 54.6km². The Reserve is situated in the Juaben District of the Ashanti, about 35 km South-east of Kumasi and about 4km off the main Kumasi-Accra road at the village of Kubease. Six communities— Krofofrom, Kubease, Ndobom, Koforidua, Nkwankwaduam and Tsetsekaasum, surround the Reserve. In 1936 the Juaben stool, which holds the largest portion of the Reserve land, lifted a formal ban on farming activities and the area that now contains the BFRBS was partially occupied by farmers (Eshun et al., 2014).

Data collection and Analysis

The study employed a mixed-method approach. The study relied largely on primary data. In total, 115 semi-structured questionnaires were administered to selected residents from the Kubease community near the Sanctuary. The target population involved the Kubease community and the management staff of the Sanctuary including a palm-wine tapper and the Queenmother of Kubease, who are known to possess a vast repertoire of knowledge on the forest. The focus group discussion involved eight individuals including the manager of the Sanctuary and seven individuals from the Kubease community, used to provide more data on the local ecological knowledge on the forest. The data from the questionnaires were analysed using descriptive and inferential statistics with the aid of SPSS Version 16. The study also employed thematic analysis for the qualitative data (Denzin and Lincoln, 2005; Eshun, 2011; Mkono, 2013). In this study, the transcribed data from the unstructured interviews and focus groups were read through several times to gain an overall perspective of the data. This was to relate data to issues to the study objectives. Next, the sections of data which answered the research questions were coded for more detailed and nuanced analysis. The categories of themes that highlight recurrent patterns, representing emergent themes on methodological choices were noted (Mkono, 2013).

Results and Discussion

The Socio-Demographic Characteristics of Respondents

Out of a total of 115 respondents, 71 (61.7%) were males whereas 44 (38.3%) were females. Out of a total of 115 respondents, the two leading age groups were 28-38 (33.9%) and 18-27(22.6%). The relatively youthful age structure at Kubease community reflect the general youthful population of Ghana, with 32% estimated at below 15 years of age (Ghana Statistical Service, 2012).The implication of this findings is that with Kubease having a very youthful population, TEK has the tendency of fading out because as it stands now the youth have little or no knowledge about the ecological knowledge BFRBS. This further lays credence to the importance of the study to help research and document TEK in Ghana. Although tour guide are trained in the general knowledge on the species in the Sanctuary, knowledge in ecological knowledge on the species in the Sanctuary helps in both marketing and sustainability of the biodiversity. The level of education was classified into five groups, *inter alia* no formal education, primary, and junior high, senior high and tertiary respectively.



The study showed that 16.5% of respondents had no formal education, primary education indicated 39.1%, 40% of respondents had their level of education to the junior high level and 4.3% had senior high education. No tertiary education was recorded. This confirms a study by Eshun et al (2014), which stated that higher education achievement in the communities around BFRBS is generally very low. Also, out of 115 respondents, 50 (43.50%), were indigenes, while 65(56.5%) were migrants. Indigenes tend to be more aware about particular types of TEK, while migrants may be less aware of them.

Flora and Fauna Species at BFRBS

Out of a total of 115 respondents, 73(63.5%) of these answered to “no” and 42(36.5%) responded to “yes”. This shows that most respondents are not aware of the rich indigenous history of BFRBS. This is due to the fact that Kubease is populated by the youth who have inadequate TEK on Bobiri. Traditionally, children and youth actively participated alongside parents and elders in harvesting and processing these resources from now protected areas.

Similarly, Dei (2000) avers establishment of fortress conservation TEK is increasingly effacing among the youth who have largely taken other occupations which is often off the land. There are 400 species of different butterflies in BFRBS, with over 6000 different plant diversity in terms of trees, shrubs and climbers (Eshun et al., 2014). Most of the butterflies in the forest are tropical butterflies meaning that they survive around the tropics and in equatorial regions and mostly are also forest dwelling because they feed on fallen fruits from trees and even the sap from some trees and may never visit the open fields. The butterflies are seasonal in nature because they go through a life cycle so at some point in the year you do not find them in large quantity. So when ecotourism was initiated at BFRBS and to attract these butterflies to the open space and to enable them to feed on nectar, they embarked on planting flowers, providing shade and providing fruits such as oranges.

Flagship Species and Issues of TEKs at BFRBS

The respondents could list a number of trees including wawa, odum, mahogany and sapele. This is because they had previously been relying on these resources for their use in the communities. The respondents also were conversant with some of the important faunal species in the Sanctuary. The focus was on the rarity and richness of floral species in the Sanctuary. Most authors on ecotourism maintain that the rarity of a particular species has a way of securing research currency and appeal for conservation and tourism (Fennell, 2008; Honey, 2008; Eshun and Tagoe-Darko, 2015).

In Ghana, ecotourism development has often been spearheaded by foreign researchers and donors who develop interest in the uniqueness and rarity of the fauna and flora in particular areas (Eshun, 2011). Interestingly, from the focus group discussion, the faunal species that were frequently mentioned were the reed frog and two butterfly species namely *Papilio dadanus* and the African Giant Swallow Tail (Fig. 3).

Fig. 3: *Papilio antimachus* Local name: African Giant Swallow Tail



Source: BFRBS Office, 2015.

The reed frog is endemic to the Sanctuary, the only other place that such specie has been spotted is in Malaysia. So in July 2015, researchers from Malaysia visited the Sanctuary to conduct research on this unique specie. However, the leading flagship faunal specie at BFRBS is the African Giant Swallow Tail. This butterfly species has a collective distinction of being the largest butterfly in West Africa. This butterfly species has long narrow wings showing orange brown are with black markings. Besides the butterflies and reed frog, the respondents did not give much information other than faunal species in the forest. One focus group discussant stated clearly:

“Since my childhood, we use to collect some snails and also hunted in the forest. We used these animals for food. Sometimes we catch a baby monkey and we use it as a pet. All has stopped. But we are aware that they are some trees and plants in the forests that are very strange and served many spiritual purposes, but now we cannot have access to them, because of the forest people” (A Discussant, Focus Group, Kubease community).

Berkes (1993) stresses that TEK represents experiences of direct human contact with the environments acquired over many years. The study proceeds to present some of the leading floral species that emerged from the findings and their corresponding TEK.

Raffia hekila

It is one of the largest trees at BFRBS. It produces a fluffy substance called kapok used for the stuffing of pillow. Locals go about in the forest to collect these fluffy substances. In November and December, it produces a red colour flower that was used locally to indicate the beginning of an eminent dry season. Locally, they used this ecological knowledge to tell how close they were to the dry season, thus farmers knew what to do. It has a giant buttress root and thorns to protect it

at the early stages of its development. This is because its fresh green leaves are used locally for culinary purposes. Traditionally, women used them for the preparation of healthy soups - thus the thorns at the young stage are to prevent the leaves from being plucked indiscriminately. The spaces in the tree provided habitats for some animals and also protection from the vagaries of the weather. It is used as point of hunting because animals were mostly found in such places. This plant species is close to the Bobiri River, it normally grows best close to a source of water.

Fig. 4: *Raffia hekila* Local name: Nyamedua Source: Fieldwork, 2015.



Study shows that minority of the respondents knew of the medicinal benefits of this tree. A pot containing rain water was placed on tree or stump and the water poured into the pot from time to time is used in traditional benedictions and purificatory ceremonies. Still 'nyamedua' serves as a symbol of dependence on God for the people of Kubease and for the Akan's in general. The Asantehene (the King of the Ashanti Kingdom), has his regalia including a 'nyamedua' stump which is covered with the leopard skin. This is often carried by an attendant who follows closely behind the Asantehene during public festivities. 'Nyamedua' also produces a sticky whitish fluid that is used as local adhesive. It was known by the Queen Mother of Kubease that the nyamedua tree is used for the treatment of measles in children.

Aside from medicinal benefits, the 'nyamedua' tree has religious significance. It served as a symbol of dependence on God. The tree was cultivated in palaces, shrines and family houses and a stump of it was placed at the entrance of each of these places.

Antiaris toxicaria

This tree species is rare and unique to BFRBS and the bark was used traditionally in making of cloth which was used by many traditional kings and chiefs including the Ashantehene (Asante King). It was also used for making mats. The belief is that sleeping on it prevents one from witchcraft attacks and other evil forces. The bark of this tree is removed and beaten to achieve a textile-like material. It is highly poisonous and was in the olden days for biological warfare.

Fig. 5: *Antiaris toxicaria* Local name: Kyenkyen



Source: Fieldwork, 2015.

Traditionally people who used the bark of the tree for medicine died instantly because they were unaware of the high toxicity of the kyenkyen tree, hence the twi song 'Kyenkyen bi adi m'ewu' (twi, meaning a poisonous tree has caused a calamity). Currently at BFRBS, tourists especially the domestic visitors, are curious to see this tree because of the popularity of that song. Tour guides caution visitors to wash their hands after tuching the back as a form of precaution.

Delbergia Lactia

This plant has an elaborate stem with crucial religio-medicinal significance. Traditional healers collect its leaves at midnight owing to its ritual signigance. Healers were supposed to be naked. The 'homakyem' plant is believed to be a god and that the leaves preserves their spiritual and medicinal powers. When the tree fully grows , the sap that comes out of it has a reddish color just like blood. This made a lot of people mostly in the pre-colonial days in Ghana to believe that, 'homakyem' is a spiritually possessed plant, and that no one was to cut the it down or part of it without undergoing some rituals. A tour guide of BFRBS added that:

"Tourists are fanscinated about this plant. Sometimes I see them stretching their necks to see the leaves of the plant as their face show awe about the historical and traditional beliefs associated with the plants" (Tour Guide, Fieldwork, 2015).

Fig. 6: *Delbergia Lactia* Local name: 'Homakyem' Source: Fieldwork, 2015.



The sap from the leaves were also used as a local sedative especially for mental patients. This helped the herbalist or local medicine practitioners to be able to attend to the aggressive patients and offer medical assistance. The religious and myticisms sorrounding it have made this tree one of the best attractions in the sanctuary. This finding is consistent with Eshun and Tagoe-Darko (2015), who indicated that the tree continues to excite visitors to the sanctuary.

Entandrophragma cylindricum

Sapele is a commonly exported and economically important African wood species (Hawthorne and Abu-Juam 1995; Owusu, 2001; Eshun, 2011). It is an important source of timber for both local and international use. It is occasionally used as a substitute for Genuine Mahogany, and is sometimes referred to as “Sapele Mahogany.” Sapele is endemic to BFRBS.

Fig. 7: *Entandrophragma cylindricum* Local name: Sapele



Source: Fieldwork, 2015.

In Ghana sapele is vulnerable, therefore, loggers are obliged to seek permits from FORIG before they embark on any logging operations. However, at BFRBS, they can be seen in large numbers. As a consequence, tourists who have heard about sapele are thrilled to see one and has become one of the flagship floral species in the sanctuary.

Discussion of TEK, Ecotourism and Marketing at BFRBS

Out of 115 respondents, 110 (95.7%) responded to “yes”, while 5(4.3%) responded to “no” on whether TEK has immense benefits for Bobiri forest. TEK is very important and can be tapped to develop the forest. They have certain knowledge concerning certain wild fruits, animals and certain beliefs, myths and even the origin and uses of certain species, which constitute amount



of useful knowledge. However, the TEK have not been documented, they tend to be ignored and researchers (Eshun et al., 2015). For instance, Friday is a taboo day in Bobiri and even before the government took over no one entered the forest on this day. A member of the Kubease community added:

“The traditional belief was that the forest is a Friday born female and that on Fridays she does certain things and that nobody must enter the forest and disturb her routine on the day”(Female, Kubease Community member, Fieldwork, 2015).

These were myths but they were helping in sustaining the forest because the locals knew that although they can enter the forest any other day, entering the forest on Fridays could bring a spiritual calamity on them. Thus documentation of TEK on the forest and sanctuary could form part of the preservation policy that would purposely preserve the history behind the settlement and the forest and would be very useful in the marketing of BFRBS and its surrounding communities as an ecotourism destination. Inglis (1993) claims that TEK includes an intimate and detailed knowledge of plants, animals and natural phenomena, the development and use of appropriate technologies for hunting, fishing, trapping, agriculture, forestry and a holistic knowledge or world view which parallels the scientific disciplines of ecology (Hens, 2006; Johnston, 2000). Huntington et al (2004) state that TEK and natural science knowledge combined have not realised their potential in tourism development. Optimistically, out of 115 respondents, 113 (98.30%) of the respondents indicated in the affirmative that scientific knowledge and TEK when combined in operation could contribute to sustainability of BFRBS.

Out of the total respondents of 115, 32 (27.80%) indicated that TEK alone can contribute to the survival of BFRBS whereas 83 (72.20%) responded otherwise. Furthermore, 23 (20%) of the total respondents claimed that TEK lacks credibility, and 9(7.8%) of the total respondents said TEK has minimal impact on the marketability of the Sanctuary. However, 33.9% of the total respondents claimed that TEK is as important as scientific knowledge in managing the Sanctuary.

Also respondents were asked to respond to which method of management they deemed fit for the survival and sustainability of BFRBS. As many as 110 respondents (95.7%) of the total respondents of 115 responded that they preferred the management from FORIG. The remaining (5) 4.3% claimed they preferred local community elders to manage BFRBS (see Table 2).

Table 2 Traditional Conservation and Modern Conservation Practices

Type of preservation	Frequency	Percentage
FORIG'S preservation	110	95.70%
Traditional preservation	5	4.30%
Total	115	100.0

Source: Fieldwork, 2015.

A cross tabulation was undertaken to examine the marketability of BFRBS through TEK. As shown in Table 3, 115 respondents were made to respond 'yes' or 'no' to the marketability of BFRBS due to the available awareness and benefits of TEK to the Sanctuary.



Table 3 Cross tabulation of TEK and Marketing of BFRBS

		Do you also agree that TEK only can market Bobiri forest		Total	
		Yes	No		
Does TEK have any benefits on Bobiri forest	Yes	Count	7	103	110
		Expected Count	7.7	102.3	110.0
		% of Total	6.1%	89.6%	95.7%
No	Count	1	4	5	
		Expected Count	.3	4.7	5.0
		% of Total	.9%	3.5%	4.3%
Total	Count	8	107	115	
		Expected Count	8.0	107.0	115.0
		% of Total	7.0%	93.0%	100.0%

Source: Fieldwork, 2015.

From Table 4 using Pearson's interval measurement, the value -0.109 indicates a weak relationship whereas with 0.245 shows a very weak relationship. It could be interpreted that there is a very weak relationship between the benefits of TEK to Bobiri Forest. Furthermore, there is a weak link on how TEK only can market BFRBS. This finding contrasts Eshun and Tagoe-Darko (2015) who stressed that in Kenya TEK promotes the marketability of especially ecotourism sites. As high as 95.7% of the respondents indicated that TEK have benefits on BFRBS, whereas 103 that is 89.6% did not agree that TEK only can market BFRBS (Table 4).

Table 4 Symmetric Measure

Interval	Value	Approx. Sig.
Pearson's R	-.109	.245
N of Valid Cases	115	

Source: Fieldwork, 2015.



Although BFRBS has the biggest butterfly in West Africa, these butterflies are not easily identified because of their seasonal nature. Therefore, if the African Giant Swallow Tail is used to market BFRBS, there is a very high tendency that many visitors to the Sanctuary in the off-season will be dissatisfied. This is because visitors will come to BFRBS hoping to see the biggest butterfly as well as other butterfly species but cannot meet their expectations. A similar case nearly happened at Ghana's leading ecotourism site—Kakum National Park, where elephants which are supposed to be the flagship species in the park are nowhere to be seen on touring the site. However, the canopy walkway, was then positioned as an attraction on its own, which has so far helped to ensure steady influx of visitors since 1996 (Owusu, 2001).

Based on these observations, the researchers proposed that BFRBS should be marketed using hiking through the forest where the flora species such as Kyenkyen, Homakyem, Nyamedua among others which have been identified as the flagship species with their TEK well addressed. Eshun et al (2014) argued trenchantly that ecotourism in BFRBS, cannot be marketed on just scientific knowledge, but rather, it should be marketed by fusing both scientific knowledge and TEK. Eshun (2011) researching on ecotourism development in Ghana, indicated that there should be fusion of TEK and scientific knowledge in the management of ecotourism sites, if the country stands any chance of competing profitably against African ecotourism giants such as South Africa and Kenya (Figure 9).

Fig. 8 Fusion Knowledge from Respondents

Local Ecological Knowledge	Scientific Knowledge
<ul style="list-style-type: none">• TEK is holistic and has lots of benefits which include medical, marketing and sustainability benefits, like Homakyem and prekese have rich history.• TEK is based in the community and obtained from the community members.• TEK is value loaded which encompasses beliefs on some tree species such as Homakyem, Kyenkyen, prekese and some traditions on the forest as a whole.• The TEK lies within the whims and caprices of authority of the community that's the elders in the community who have vast knowledge.	<ul style="list-style-type: none">• Scientific knowledge is systematic names of tree species based on experimental and knowledge testing.• Scientific knowledge identifies the botanical names of various species available and compliments it with scientific meanings to them.• Scientific knowledge documents the information and makes it authentic.• Scientific knowledge of tree species like homakyem and prekese does not promote a strong marketing strategy for Bobiri Forest and Butterfly Sanctuary.



Yli-Pelkonen and Khol (2005) argued that TEK is seen as subjective knowledge that is often based on people's emotions and feelings. There is also the seeming lack of political will by local communities to participate in ecotourism development in especially Africa, and with this their knowledge inclusion is often sidelined by technocrats who almost always favour scientific knowledge (Dei, 2000; Coria and Calfura, 2012; Eshun and Tagoe-Darko, 2015). AChao and Hsu (2011) researching on the Smangus tribe in Taiwan, revealed that like Africans, they were educated outside of their own culture and traditions. This demands that locals are involved in ecotourism development to help preserved some of their knowledge that may be relevant for the objectives of ecotourism development. Nabhan cautions that, "Ethnobiologists should not confine themselves to taxonomic inventories, but should devote more time to eliciting and testing ecological knowledge from folk practitioners". Chao and Hsu (2011) further add that tourism development experts should see TEK but evolving and adaptive, this acceptance will let them seek for the potential for fusion knowledge in tourism development, that contribute to sustainable development. Eshun (2011) has argued forcefully, that tourism developers must abstain from seeing local community members as being ignorant of ecological issues, since often they have been living with these natural endowment for a long time.

Conclusion and Recommendations

This paper focuses on the nexus of ecotourism and local ecological knowledge. The study identified the flagship species available at BFRBS, and how TEK based on them contributes to the unique selling proposition of the Sanctuary. Currently, TEK at the Sanctuary is not fully documented and seems to lack credibility compared to scientific knowledge. Most of the conservation operations at the Sanctuary are at the back of scientific knowledge.

Based on the findings of the study, certain recommendations have been devised in order to create fusion knowledge that actually increases the visitor experience at the Sanctuary. TEK must be well documented and disseminated to tourists, locals and other relevant stakeholders through public education. This should be achieved by starting at schools, where schoolchildren from the local communities are educated about TEK in their environment. FORIG must also learn to embrace TEK. TEK has the potential for conserving and contributing to the sustainability of BFRBS. This demands that TEK is well-documented in FORIG's preservation policy and management on the Sanctuary. The Ghana Tourism Authority in collaboration with the management of BFRBS should formulate a marketing strategy as a means to facilitate the marketing and promotion of TEK in ecotourism. More research is needed across the country to document TEK at all ecotourism destinations. There is however a caveat: TEK should be backed by scientific knowledge to ensure that the conservation mandate of ecotourism is not compromised. As a result, scientific research should be carried out on TEK at all ecotourism destinations in the country, in order to validate their ultimate utility. This will help to curb further the ambiguity and misconceptions about TEK its significance in ecotourism.

References

- Akama, J.S. (1996). Western environmental values and nature-based tourism in Kenya. *Tourism Management*, 17(8), 567-574.
- Akama, J.S. & Kieti, D. (2007). Tourism and Socio-economic Development in Developing Countries: A Case Study of Mombasa Resort in Kenya. *Journal of Sustainable Tourism*, 15 (6), 735-748.



- Amanor, K.S. (2001). Land, Labour and the Family in Southern Ghana a Critique of Land Policy under Neo-liberalisation Research. Report No. 116 Uppsala: Nordiska Africa institute.
- Attuquayefio, D.& Gyampoh, S. (2010). The Boabeng-Fiema Monkey sanctuary, Ghana: A case for blending Traditional and Introduced Wildlife Conservation Systems. *West African Journal of Applied Ecology*, 17, 1-10.
- Berkes, F. (1993). Traditional ecological knowledge in perspective, In J. T. Inglis (Ed.), *Traditional Ecological Knowledge: Concepts and Cases*, Ottawa, Canada: Canadian Museum of Nature and International Development Research Centre.
- Butler, L. & Waud, J. (1990). Strengthening extension through the concepts of Farming Systems Research and Extension (FSR/E) and sustainability. *Journal of Farming Systems Research-Extension*, Vol. 1(1), 77-98.
- Chao, L-S.& Hsu, P-H. (2011). Learning about the development of Ecotourism in the Context of Smangus Tribe's Traditional Ecological Knowledge, *GeoJournal of Tourism and Geosites*, 1, 7-21.
- Coria, J.& Calfura, E. (2012). Ecotourism and the Development of Indigenous Communities: the Good, the Bad and the Ugly. *Ecological Economic*, 73, 47-55.
- Dei, G. J. S. (2002). Spiritual knowing and transformative learning, In E. O'Sullivan, A. Morrell and M. A. O'Connor (Eds.), *Expanding the boundaries of transformative learning: essays on theory and praxis*, New York: Palgrave.
- Denzin, N.K. & Lincoln, Y.S. (2005). *Handbook of Qualitative Research*. 3rd ed. London: Sage.
- Eshun, G. (2014). Towards the Dual Mandate of Ecotourism in Africa: Comparative Evidence from Ghana. *African Insight*, 44, 164-184.
- Eshun, G. & Page, S. (2013). Revisiting Ecotourism in Africa: A Case Study of BFMS and Kakum National Park, in Ghana. A Paper presented at the 2nd World Tourism and Hospitality Research, Rosen College, UCF, Florida, USA. Dec. 15-17.
- Eshun, G. & Tagoe-Darko, E. (2015). Ecotourism development in Ghana: A postcolonial analysis. *Development of Southern Africa*, 32, 392-406.
- Eshun, G. & Tonto, J.N.P. (2014). Community-based Ecotourism: Its socio-economic impacts at Boabeng-Fiema Monkey Sanctuary, Ghana. In: Rogerson, CM, and Szymańska, D. (Eds), *Bulletin of Geography. Socio-economic Series*, 26, 67-81.
- Eshun, G. (2011). *Ecotourism and Social Science Research: A Postcolonial Study*. VDM: Germany.
- Eshun, G., Agyei, P O-W & Baah, A. (2015). Where is community quality well-being in ecotourism research in Africa? A case from Ghana. *African Journal of Hospitality, Tourism and Leisure*, 4, 1-12.
- Ghana Statistical Service, (2012). *Population and Housing Census*, Accra, Government of Ghana.



Eshun, G., Frempong, F. & Adjei, P.O-W, (2014). The Prospects of Ecotourism as a Conservation and Development Tool at Bobiri Butterfly Sanctuary in Ghana. *Research on Humanities and Social Science*, 4(22):1-9.

Hawthorne, W.D. & Abu-Juam, M. (1995). Forest Protection in Ghana with Particular Reference to Vegetation and Plant Species. IUCN: Gland, Switzerland.

Hens, L, (2006). Indigenous Knowledge and Biodiversity Conservation and Management in Ghana. *Journal of Human Ecology*, 20 (1), 21-30.

Honey, M. (2008). (2nd Ed) Ecotourism and Sustainable Development: Who Owns Paradise. Washington: Island Press.

Johnston, A. (2000). Indigenous peoples and ecotourism: bringing indigenous knowledge and rights into the sustainability equation. *Tourism Recreation Research*, 25(2), 89-96.

Leach, M. & Mearns, R. (Eds.) (1996). The Lie of the Land: Challenging received wisdom on the African Environment. Oxford: James Curry.

Milazi, D. (1996). Ecotourism, Conservation, and Environmental Sustainability in Africa Botswana. *Journal of African Studies*, 10 (1), 29-46.

Mkono, M. (2013). African and Western tourists: object authenticity quest? *Annals of Tourism Research*, 41, 195-214.

Nabhan, G.P. (2000). Interspecific relationships affecting endangered species recognised by O'Odhan and Comcaac Cultures, *Ecological Applications*, 10: 1288-1295.

Owusu, E. H. (2001). Community Forest Conservation in Ghana: The Potential of Mount Afadjato and Agumatsa Range for Ecotourism. University of Kent: PhD thesis.

Rajasekaran, B. (1993). A framework for incorporating indigenous knowledge systems into agricultural research, extension, and NGOs for sustainable agricultural development. Studies in Technology and Social Change No. 21. Ames, IA: Technology and Social Change Program, Iowa State University.

Sarfo-Mensah, P. & Oduro, W. (2007). Traditional Natural Resources Management Practices and Biodiversity Conservation in Ghana: A review of local concept and issues on change and Sustainability Available at:
<http://www.feem.it/Feem/Pub/Publication/V/Papers/default/Accessed/29/09/17>).

Shehab, M. (2011). Tourism-led Development in South: A case study of the MakuTEKe Partnership with Wilderness Safaris (PhD thesis). University of Witwatersrand, Johannesburg.

Wanga, J.O., Hayombe, P.O., Odunga, P. & Odede, F.Z.A (2013). The Nexus between environmental knowledge and ecotourism attitude among the local youths in Co-educational Secondary Schools in Bondo Sub-County, Siaya County, Kenya. *International Journal of Business and Social Research (IJBSR)*, 3, 103-116.



Yeboah, T. (2013). Ecotourism Development in Ghana: A case of selected communities in the Brong-Ahafo Region. *Journal of Hospitality and Management Tourism*, 4(3), 74-77.

Yli-Pelkonen, V. & Khol, J. (2005). The role of ecological knowledge in Urban Planning: Perspective from Finland. *Sustainability Science, Practice and - Policy*, 1 (1), 1-14.

Zapata, M.J., Hall, C.M., Lindo, P. & Vanderschaeghe, M, (2011). Can community-based tourism contribute to development and poverty alleviation? Lessons from Nicaragua. *Current Issues in Tourism*, 14 (8), 725-749.