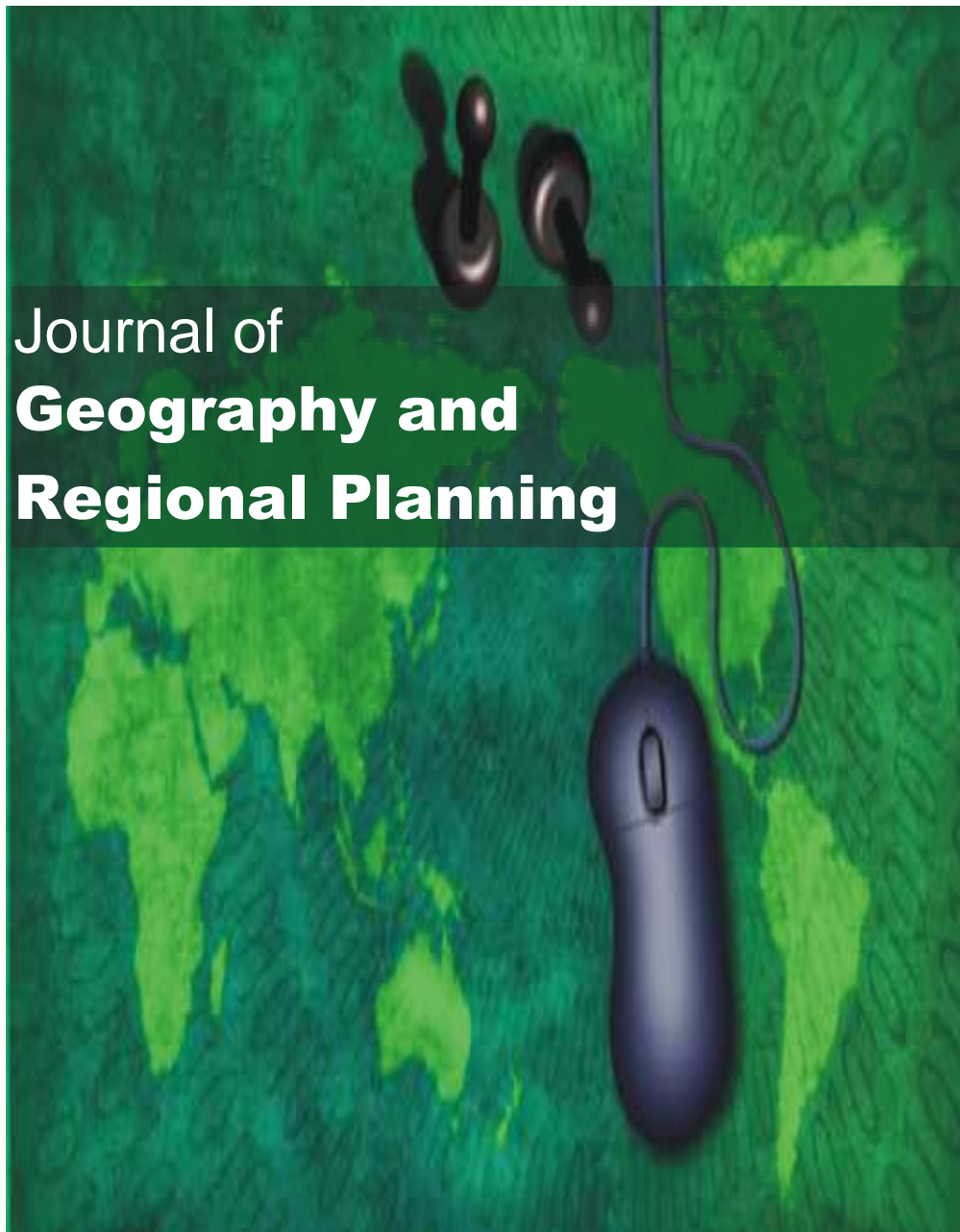


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Table of Content

Sustainable eco-tourism in Ghana: An assessment of environmental and economic impacts in selected sites in the Upper East Region

Abdul-Kadri Yahaya*, Akonga Samuel and Alhassan Abdullah

30

Full Length Research Paper

Sustainable eco-tourism in Ghana: An assessment of environmental and economic impacts in selected sites in the Upper East Region

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This paper assesses sustainable eco-tourism in Ghana with an emphasis on environmental and economic impacts. The study resorted to mixed methods research approach in data collection, analysis and presentation. The study sampled 208 respondents for the questionnaire administration. Besides questionnaire administration, the study employed Key Informant Interviews for the collection of qualitative data. The study reveals that households in eco-tourism communities engage in tourism as a secondary activity from which proceeds are used in providing basic needs. Environmentally, the conservation of natural resources has been a key sustainability issue for eco-tourism development. The sustainability of eco-tourism in rural Ghana lies in its positive environmental and economic impacts on the lives of households in eco-tourism communities.

Key words: Fringe communities, eco-tourism sites, environmental impacts, economic impacts, livelihoods, rural economy.

INTRODUCTION

The rapid growth and development of tourism has made it one of the giant industries globally. Tourism is more than just going on vacation; it encompasses both domestic and international travel activities that include movement to enjoy the scenery of the environment. The literature recognizes the critical role of tourism in the economic growth of many countries, the benefits of which are critical in terms of foreign exchange receipts, the balance of payments, government revenues, employment, and ecological sustainability. It is a major source of income and employment in many rural communities, especially in the developing world. It increases employment

and household income while also giving community members the opportunity to diversify their income streams. Many other sectors in the value chain, such as lodging, catering, transportation, retail, and entertainment, benefit greatly from the industry, promoting community interest and global economic growth. In some cases, it contributes to a broader cultural understanding by raising awareness of and respect for cultural differences and ways of life.

Eco-tourism, as one of the major tourism sub-sectors globally, catalyzes sustainable rural development (Giulietti et al., 2018). The industry has improved the lives of

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many rural folks, particularly those who engage in the eco-tourism business. It means that the sector accommodates and entertains visitors in a way that is least damaging to the environment while also supporting the livelihoods of local communities (Hussain, 2022).

According to Khamidov and Khayrullaeva (2021), the primary responsibility of eco-tourism is to conserve nature and the ecosystem in order to maintain a harmonious and mutual bond with nature. Eco-tourism constitutes a niche within the larger tourism industry as a potential sustainable development tool. It is also operated very differently than the rest of the travel and hospitality industry because it is defined by its sustainable development effects, which include conserving and preserving nature, educating tourists about local culture, creating healthy environments, protecting biodiversity, and benefiting local communities (Kummitha et al., 2021). Eco-tourism is premised on nature and cultural heritage and includes geographical location, micro-climatic conditions, availability of water, natural beauties (that is, vegetation, wildlife, surface features/ geomorphological features, etc.), local cuisines, festivals, and pageants, traditional agricultural activities, local handicrafts, local dress culture, historical events and personalities, heritage attractions, architectural diversity, traditional music and folk dance, artistic activities and so on (Kiper, 2013; Guri et al., 2020; Sumani and Osumanu, 2021).

The Brundtland Commission's principle of providing for the tourism needs of today's tourists and host communities without jeopardizing future generations' ability to meet their own tourism needs underpins sustainable eco-tourism (Albrecht and Haid, 2022). Again, it involves the use of conservation to enhance communities' resources so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be improved (Zoysa, 2021). Sustainable ecotourism is seen ecologically from the perspective that current activities preserve the resource base and do not jeopardize the ability of future generations to utilize the resource (Kalaitan et al., 2021). In this context, sustainable eco-tourism is understood to be travel that fully acknowledges its past, present, and potential economic, social, and environmental effects while meeting the requirements of travelers, businesses, the environment, and local communities (Sultana, 2022). Sustainable eco-tourism seeks to incorporate environmental, economic, social, and cultural issues in planning and decision-making and recognizes that ecological integrity and economic sustainability are central to socio-economic well-being, especially when considering the needs of both present and future generations (Bausch et al., 2021). Despite the industry's enormous benefits, the anticipated benefits of sustainable eco-tourism frequently elude the local people (Jahan and Akhter, 2018). Simultaneously, the increasingly adverse impacts of eco-tourism on the ecology have gradually become a global concern that needs critical attention. The sector has become very significant in economic and

environmental development as its operations could cause damage to the economic and environmental conditions of tourist sites if appropriate measures are not put in place (Kisi, 2019). Given this general context of sustainable eco-tourism, many issues of sustainability arise. Even though, some studies have been carried out in the area of sustainable tourism (For instance Brendehaug et al., 2017; Salazar, 2017) focused on sustainable tourism and policy implementation as well as environmental policy integration strategy for greening the economy. Sustainability, in the context of tourism, is often used narrowly to mean "carrying capacity," which reflects the notion that a limit on resources implies a limit on the number of tourists (Salazar, 2017).

With all of the advantages of ecotourism for rural communities and developing countries, the question that remains unanswered is whether the outlying communities benefit from the very resources they own or not. The aim of the paper is to assess the impacts of sustainable eco-tourism in Ghana by focusing on the environmental and economic dimensions using selected eco-tourism destinations in the Upper East Region. The paper also sought to provide answers to the following research questions: What are the features of eco-tourism attractions? How are household engaged in eco-tourism related activities? What are the economic impacts of eco-tourism? What are the environmental impacts of eco-tourism? The significance of this paper is the contribution it seeks to make to the sustainable eco-tourism debate by broadening the discussion beyond carrying capacity issues. The study is premised on the foundation of the conceptual framework in Figure 1. The framework carefully examined the factor that enhances effective tourism management and the effects effect of management on sustainable tourism in destination sites.

Conceptual framework of study

The study is guided by the conceptual framework in Figure 1. The components of the conceptual framework are eco-tourism management, stakeholder engagement, decision making, empowerment, pillars of sustainability, and sustainable ecotourism management.

Eco-tourism management

This is the practice of ensuring that the operations of a tourist site meet the standards for ecological preservation. It is a tool for effective management, conservation, and protection of the pristine environment and cultural heritage sides. Eco-tourism management has the potential of promoting the economic, social, and cultural sustainability of many tourists' destinations. The management process cuts across many spectrums of the environment including the existence of the facility without necessarily affecting the system and environment while delivering the best of services (Figure 1).

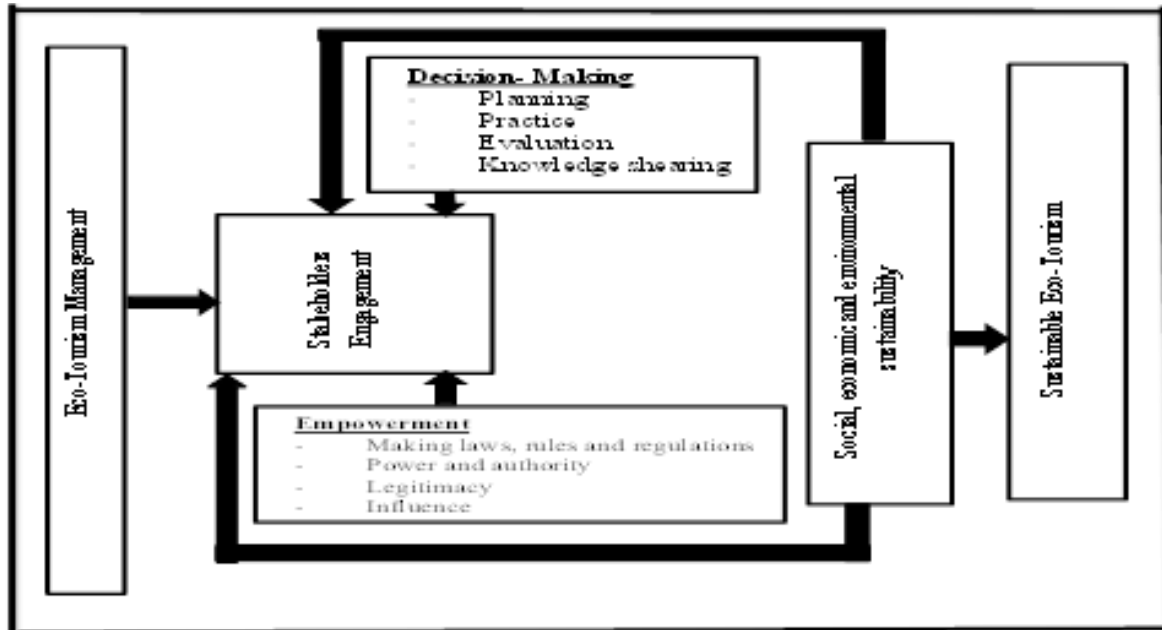


Figure 1. Conceptual framework of study.
Source: Authors Construct, 2021

Stakeholders' engagement

Stakeholders are a very important component in resource management. Hence, it is a great concept in tourism management as well. Stakeholders are simply people whose actions and inactions can either affect a tourist site positively or negatively (Choi and Murray, 2010). They include both the direct and indirect beneficiaries of a tourist site.

Bringing on board stakeholders' engagement will help in the continued existence of the facility through their cooperation and taking themselves as part of the management body. These stakeholders can be part of the management board of a tourist site through the following means.

Decision-making: Stakeholders should be actively involved in all decisions that are made to manage the tourist sites. The participation will be in the form of planning and putting into practice the roadmap of the sites (Nunkoo and Ramkissoon, 2011). They can also take part in the evaluation process of the state of the tourist site as well as knowledge sharing to highlight pertinent issues relevant to the site administration and management.

Empowerment: For any stakeholder to be able to actively and effectively take part in any management processes in a tourist site, they should have the power to take actions and inactions. This can be done by giving stakeholders the chance to make and unmake laws, rules, and regulations regarding the tourist sites (Figure

1). When this is done; some sort of power and authority will be on their side to feel being part of the entire process. It will therefore be legitimate for them to operate without fear or panic and this can help them influence all proceedings to win the support and views of the general public and their followers (Manu and Kuuder, 2012).

Pillars of sustainability

For a tourism site to be sustainable, it has to meet three (3) parameters of sustainability; namely; Social, economic, and environmental sustainability (Choi and Murray, 2010). The existence and operation of tourist sites should not affect the social life of the people such as the traditions, culture, and heritage sites but rather help improve it for the betterment of society especially, the fringe communities. Effective management of eco-tourism sites culminates in economic benefits for the tourism stakeholders, the host community, and the national economy as well. When this happens, people forge to pull their weight to improve it (Figure 1). Another issue any tourist site should not fail to meet is the fact that its operation should not affect the environmental quality; thus, the ambient quality of the environment.

Sustainable eco-tourism

The concept of sustainable tourism denotes the situation whereby a tourist site is used over and over again without degradation to deny the future generation to use it. This is a new approach to resource conservation globally. On

the other hand, it has become the order of the day in modern-day resources management, especially in the developing world. When the three (3) pillars of sustainability are met, it will eventually lead to sustainable tourism (UNWCED, 1987). On the other hand, when the attempts by management or operators did not lead to sustainable tourism, then there is the need for the stakeholder to be reviewed to meet the needs and interests across board (Figure 1).

Conceptual framework of sustainable eco-tourism

The conceptual framework in Figure 1 depicts the interplay between various variables such as stakeholders' engagement-empowerment and decision-making in ensuring sustainable eco-tourism and management.

Hypotheses

The study is guided by the following null (Ho) and alternative (Hi) hypotheses:

Ho:

- (1) Eco-tourism has no economic impacts.
- (2) There is no relationship between the salary of household members engaged in tourism activities and usage of the income earned from the tourism activities.
- (3) Eco-tourism has no environmental impacts.
- (4) There is no relationship between beautification and conservation of the environment

H₁:

- (1) There are economic impacts of eco-tourism.
- (2) There is a relationship between the salary of household members engaged in tourism activities and usage of the income earned from the tourism activities.
- (3) There are environmental impacts of eco-tourism.
- (4) There is a relationship between beautification and conservation of the environment.

Study area

The study area cuts across four districts in the Upper East Region (UER) of Ghana (Figure 2). UER is bordered to the north by Burkina Faso, the West by Upper West Region, the south by North-East Region, and to the east by Togo.

The Region has a population of 1,301,221 with (51.6%) females and 48.4% males, which constitute 4.2% of the overall national population (Ghana Statistical Service [GSS], 2021). The age structure of the Region's population shows that the proportion of the population aged 0 - 14 (under 15 years) is 41.7%, and those aged

15 - 64 and 65+ are 52.3 and 6.0%, respectively (GSS, 2021).

A portion of the region is located in the Guinea Savannah ecological belt (GSS, 2014) with average temperatures ranging between 27 to 36°C which can rise to 40°C (Anafo et al., 2020). It has a single rainy season from May to October, with an average annual rainfall of about 100mm followed by the harmattan, a prolonged dry season characterized by cold and hazy weather from early November to April, and intense hot weather that ends only with the onset of early rainfall in May (Anafo et al., 2020). Among the trees commonly found in this Region are shea, baobab, *dawadawa*, and neem, which are able to withstand drought. These trees provide fuel for domestic use as well as wood for the construction of houses (GSS, 2014). Firewood is the main source of fuel for most of the inhabitants particularly the rural folks constituting about 66.5% of fuel consumption (Ministry of Finance and Economic Planning [MFEP], 2014).

According to GSS (2021), the proportion of people employed in the Upper East Region is 71.8% with agriculture being the main occupation employing about 70.5% of the total population aged 15 years and above. The Region has 4.1% of the national housing stock and 75% were made from mud bricks or earth with most of the people in the Region living in mud houses roofed with either grass or zinc (Guddah, 2019). The principal eco-tourism sites in the Region include the Paga crocodile pond, the Pikowro Slave Camp, the Tengzug Shrine, and the Sirigu Women Pottery and Art. The tourist sites serve as a source of employment and income for many households, especially the vulnerable.

METHODOLOGY

This study used a mixed-methods research approach based on pragmatic worldviews (Yin, 2018). Mixed methods research is a method in which a researcher uses both qualitative and quantitative techniques, methods, and concepts in a single study to gain a better understanding of the subject under study (Klassen et al, 2012). Mixed methods research is based on the assumption that there are "multiple legitimate approaches to social research" (Greene, 2007: 20). Similarly, mixed-method researchers seek a number of approaches to data collection and analysis instead of subscribing to any form (Klassen et al, 2012). For this reason, to provide the best understanding of the research problem, researchers used both quantitative and qualitative data. The purpose of collecting both quantitative and qualitative data is to address the flaws of the methods used separately.

Accurate data gathering is significant in every statistical analysis. Basically, there are two methods of data collection in the research process that is, primary and secondary data (Kruger and Douglas, 2015). In order to provide answers to the research questions, both primary and secondary data were gathered. Primary data is data that is original and fresh in character. The primary data were collected from household heads, business players in tourism, and workers of the tourist sites using a semi-structured questionnaire, interview guide, and observation checklist. Secondary data involve already existing data that the researcher intends to depend on to back the quantitative data. Secondary data on the impact of

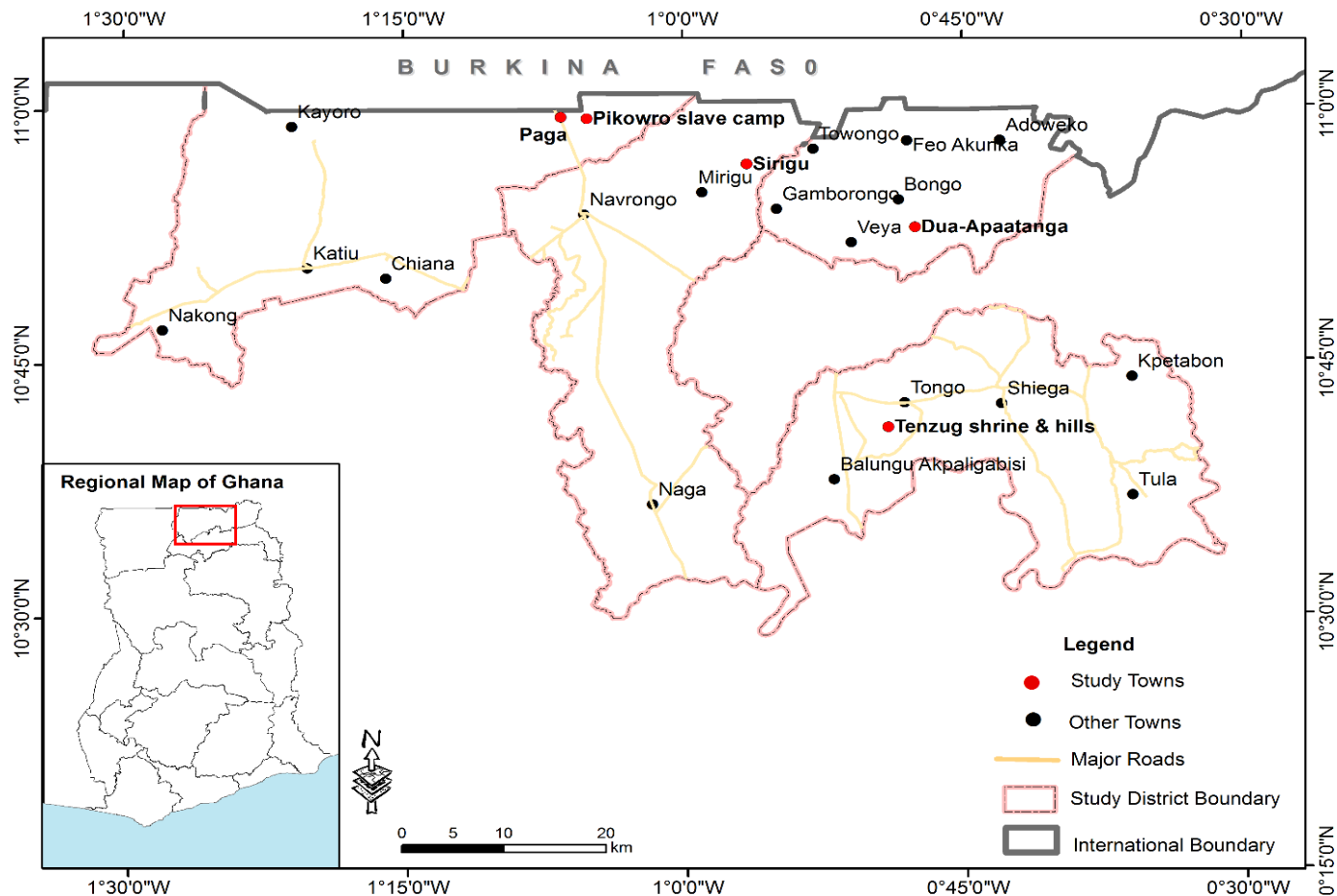


Figure 2. Map of the study area showing study communities.
Source: Authors Construct via Arc GIS

Table 1. Sample size determination.

District	Community	Number of households	Sampled Households/Target sample size	Key informant GTA	DPO
	Sirigu	196	$196/626 \times 209 = 65$	-	1
	Pikowro	121	$121/626 \times 209 = 40$	1	
	Paga	150	$150/626 \times 209 = 50$	-	
Bongo	Dua	111	$111/626 \times 209 = 37$	1	1
Talensi	Tenzug	48	$48/626 \times 209 = 16$	-	1
	Total	626	208	2	3

Source: Authors Computations based on Statistics obtained from Ghana Tourism Authority (UER), 2022).

ecotourism on household incomes and the environment was gathered from peer-reviewed journals, books, and existing data from the archives of the Upper East Regional Ghana tourism authority and managers of the tourist sites.

Three districts in the Upper East Region were purposively selected for this study by virtue of their endowments with tourist attractions. They are Kassena-Nankana West, Bongo, and Talensi. The target groups for the study were households, District Planning Officers, and officers of the Ghana Tourism Authority (GTA). The

sample size (households) for the study was determined as 208 using the formula of Yamane 1967. This was distributed among the selected districts based on the number of tourist sites in each district (Table 1). The decision on the distribution of the respondents among the districts was based on the number of communities involved in the study. Three communities were selected in Kassena-Nankana West District, and one each in the Bongo and Talensi Districts based on the presence of eco-tourism attractions.

Both systematic random sampling and purposive sampling approaches were used in the selection of the respondents. The systematic random sampling aimed at achieving representativeness of the household units in the communities while the purposive sampling was used to select units based on specific purposes (Teddlie and Tashakkori, 2009). Systematic random sampling within each community was followed to select the household units in which the questionnaires were administered. Systematic random sampling involves choosing a house at an interval where the first house was selected randomly in each community to guide any possible human bias (Babbie, 2015). The sample interval, which is the standard distance between households, was calculated for each of the communities selected. Based on the total number of houses in the sampled study communities, every 6th house was selected for the survey. The selection of respondents in each household was random, therefore, adults (respondents 18 years and older) were selected and interviewed. The GTA officials as well as District Planning Officers were purposively selected for the study. They were selected based on their knowledge of eco-tourism in the study area. This kind of technique is used in exploratory research as it involves the use of judged experts and the selection of cases with specific purposes in mind. Also, it helps in sampling appropriate cases that are unique and informative in relation to the study objectives (Neuman and Celano, 2006).

Questionnaires were administered to households in the sampled study communities. The questions were designed by taking into consideration the specific objectives of the study. The questions on the questionnaires were semi-structured.

In other words, they consisted of closed-ended and open-ended questions. Interview guides were used to collect data from key informants at the regional, district, and community levels regarding eco-tourism and its sustainability implications. At the district level, two GTA officers and three District Planning Officers were contacted for interviews.

A component of SPSS Version 20 known as descriptive statistics was used for the analysis of quantitative data. However, quantitative data were presented using tables and charts. Inferential statistical analysis was done by resorting to Pearson Correlation Analysis. On the other hand, content analysis was used for the analysis of qualitative data and presented using quotations.

RESULTS AND DISCUSSION

The study's findings are presented in five sections: nature of eco-tourism, socio-demographic characteristics, household engagement, economic benefits, and ecological dimensions of eco-tourism.

Nature of eco-tourism attractions studied

The Upper East Region serves as the gateway to Ghana from Burkina Faso and the northern parts of Togo. The Region has provided several meeting points for traders from Niger, Mali, and Burkina Faso traveling south to Tamale and Southern Ghana. The Region is an excellent tourist destination, offering visitors an exciting introduction to Ghana from the north. The area is home to various places of ecological, cultural, historical, and mythical significance. The eco-tourism attractions covered in this study are Paga Crocodile Pond; Pikowro Slave Camp; Sirigu Pottery and Basketry; Tengzug Shrine; and Dua-Apatanga rocks (Table 2). Figure 3 shows

the Images of tourism products and services in the Region.

Households' engagement in ecotourism and other related activities

The results portrayed that majority of households in the study communities did not have any members engaged in eco-tourism activities, only 34.6% of the households had one or more members engaged in eco-tourism activities. The number of people in the tourism activities from households within the fringe communities ranged from 1-3 people (21%); 4-6 people (12%); 7-9 people (1%); and 10 or more people (0.6%). The survey revealed that at least any person capable of undertaking an activity within the eco-tourism chain does so without any restrictions. Out of the 208 respondents, 63% (132 respondents) had a strong feeling that everyone in a household with the capacity to carry out an eco-tourism business activity could do so without any restrictions. Also, 16% (34 respondents) of the total households interacted with shared the belief that many of the traders at the tourist sites are women. Furthermore, 12% (24 participants) indicated that boys and girls participate in tourism-related activities within the destination communities.

According to the planning officer of Kassena-Nankana District:

"There is nothing like the domination of any group such as men or women and boys or girls. Even though there is equal opportunity for all household members to undertake business activities, many of the people who engage in trading at the tourism sites are women."

Generally, people within the study communities, especially women and children between the ages of 17 and above, engage in the sale of tourism products such as baskets, hats, and locally produced sandals to tourists as a business activity. Men usually provide other services such as tour guiding and transportation.

Economic impacts of eco-tourism

The survey showed that 47.1% of the household members who are engaged in tourism business activities made between ¹GHS300.00 to GHS400.00 every month, depending on the level of patronage by tourists. Again, 39.3% of them earned between GHS500.00 and GHS600.00 monthly and 13.6% earned more than GHS600.00 monthly. This implies that most of the people were making above the minimum monthly wage of about GHS375.90. Earning from eco-tourism activities is usually high during festive seasons and becomes low in the lean

¹ US\$1.00 was the equivalent of GHS5.80 at the time of the survey.

Table 2. Description of eco-tourism attractions.

S/N	Attraction	Description
1	Paga Crocodile Pond	This is a sacred pond (located in Paga), which is inhabited by West African crocodiles. It is also known as Chief's pond. The pond has become popular among tourists, as a result of the friendliness of the crocodiles, and it now uses tourism to feed the population of crocodiles.
2	Pikowro Slave Camp	Founded in 1704, the Pikowro Slave Camp was active until 1845. It is located in Paga-Nania (about 3 km west of Paga). The Camp was developed as a slave transit center where slaves were bought and resold in the Salaga Slave Market (after walking about 150 km to the south). From Salaga, the slaves were moved to the coast for shipment.
3	Sirigu Pottery and Basketry	The Sirigu Pottery and Basketry (located in Sirigu) provides a captivating example of rural women taking action to preserve their art and culture. The attraction is home to lovely pottery and basketry, fascinating architecture, and ornamental wall paintings. The attraction also comprises a visitors' center, gallery, workshop, and guesthouse complex where visitors can see and buy useable pottery and baskets.
4	Tengzug Shrine	One of the most famous eco-tourism attractions in the Upper East Region, the Tengzug Shrine was once a hideout for slaves evading their captors. The shrine is now used for more traditional religious animal sacrifices for good luck and to appease the ancestors of the Talensis. With the help of a tour guide, tourists can scale the rocks up to the Tengzug Shrine, remove their tops, and witness the sacrifice of birds and chickens.
5	Dua-Apatanga rocks	Located approximately 7.5 km off the regional capital, Bolgatanga, Dua-Apatanga is a naturally designed huge rock that serves as a source of tourist attraction for both inbound and unbound tourists. The hollow rocks are difficult to find. They have a complicated numbering system that leads to the top, where a beautiful view of the Bongo District's landscape is provided. Of particular attention are two large rocks for hiking: one offers great views around on top of a "mushroom" platform, and the other has an uncharted underwater cave system, with a Christian cross on top.

Source: Extracted from interviews with GTA officers in Bolgatanga, 2021.



Figure 3. Images of tourism products and services in the region.
Source: Field Survey (2021).

Table 3. Category of household members engaged in tourism-related activities.

Community	Count of category				Total	%
	Boys and Girls only	Men only	Everyone	Women only		
Dua	3	9	15	10	37	18
Paga	8	2	28	12	50	24
Pikowro	6	2	25	7	40	19
Sirigu	4	0	60	1	65	31
Tengzug	3	5	4	4	16	8
Total	24	18	132	34	208	100
Percentage	12	9	63	16	100	

Source: Field Survey (2021).

season particularly the rainy season since the majority of households are peasant farmers.

Household members engaged in eco-tourism activities invest their earnings in farming, mainly food crop production. The survey also revealed that there are other uses to the financial resources earned from activities in the eco-tourism value-chain by household members in the destination communities. For example, 71.3% of the respondents were of the view that income from eco-tourism is used to perform funerals. This has variations in terms of the males and females (Table 3). Many females used their money for funerals more than men. While 37.9% of female respondents used their earnings for performing funeral rites, only 33.4% of males expended the income earned from eco-tourism activities to perform funerals. Not only that, another usage of the income generated from eco-tourism activities is the building of residential facilities to support households' shelter needs, which represented 55.2% of the respondents' views. In terms of the male and female categories, 28% of the male respondents used the revenues made from tourism businesses for building houses while 27.2% of females used theirs on building their households. Furthermore, 49.6% of the respondents used their income spawned from eco-tourism businesses to pay their wards' school fees. While about 16.2% of males used their income to pay their school fees, 33.4% of females also used theirs in paying school fees. A few (8.7%) of them used their income in paying medical bills.

Pearson correlation coefficient was computed to investigate the association between the wage of an employee engaged in tourism activities and usage of the income earned from the tourism activities.

Firstly, the results indicate a moderate positive relationship between the wage of individuals engaged in tourism activities and usage of the income earned from the tourism activities [$r(207) = 0.699$, $P = .000$]. This means that the two variables that is, the wage of tourism stakeholders and usage of the income are directly proportional. Hence, an increase in one variable leads to a proportional increase in the other variable. Therefore, we fail to reject the null hypothesis that the correlation

between the wage of individuals engaged in tourism and usage of the income earned is zero.

On the economic benefits of eco-tourism, the Planning Officer of the Talensi District had this to say:

"If the attractions in these areas are well developed, most of the people in the communities would not be sitting idle, especially during the off-farming season. They would always be engaged in providing services to tourists for income. Some of them would be employed as tour guards, drivers, and in other income generating activities."

This was corroborated by the Planning Officer of the Bongo District when he said:

"The main source of livelihood in these communities is farming, which takes place only during the rainy season. In the dry season, people sit down idle to consume only what they produce on their farms. So, if the eco-tourism attractions in the communities are developed, they would be able to generate income from the tourism activities all year round to support their family needs".

According to the planning officers interviewed, an increase in tourists' visitation can increase the internally generated funds (IGFs) of the host districts. They postulated that revenues accruing from eco-tourism could be used to further develop the sites to attract more tourists. A GTA officer of the Bongo District revealed that when the eco-tourism potentials of the region are developed, more revenue would be generated. He said that:

"..... Developing the eco-tourism attractions in the communities would bring markets close to peoples' doorsteps and this would go a long way to boost investor confidence."

Despite the positive economic impacts that eco-tourism brings to host communities, the study also revealed some potentially negative impacts of eco-tourism projects. As economic cost or negative economic impact of developing

Table 4. Gender and uses of income from tourism activities.

Uses of income	Sex (%)		
	Male	Female	Total
Payment of school fees	16.2	33.4	49.6
Building of residential facilities	28.0	27.2	55.2
Settlement of medical bills	3.2	5.5	8.7
Performance of funerals	33.4	37.9	71.3

*Multiple responses were used in the analysis.
Source: Field Survey (2021).

Table 5. Environmental impacts of the eco-tourism.

*Positive impacts	%	*Negative impact	%
Beautification of the environment	75.0	Environmental pollution	80.6
Mitigation of climate change	40.0	Land degradation	70.0
Provision of ecosystem services	6.7	Reduction in farmland	35.6
Conservation of the environment	84.4	Bad environmental practices	35.0
Increase in the population of some wild species	46.6	No negative impacts	11.7

*Multiple responses were used in the analysis.
Source: Field Survey (2021).

the eco-tourism potentials of the communities, 65.3% of the respondents argued that the activities of eco-tourism would increase the cost of living in the communities. About the same number (63.7%) of them indicated that operations of eco-tourism businesses would affect the farmlands of the host communities, and 51.3% indicated that prices of goods and services in the local communities would rise. Also, 27.8% of respondents said that there would be an unhealthy competition that would go against small-scale businesses. However, a few (3.1%) of the respondents did not see or anticipate any negative economic impact from the activities of eco-tourism projects.

Environmental impacts of eco-tourism

The study revealed that eco-tourism activities are situated on lands earmarked as reserved areas, which also host the attractions. This was indicated by 42.3% of the respondents and 30.3% of them revealed that their economic activities are located in areas outside the parameters of the tourist sites. However, 27.4% indicated that their eco-tourism activities are sited within towns and villages. The ecological effects of eco-tourism identified were all the activities that had either positive or negative effects on the physical environment. The major positive ecological issue identified by most (84.4%) of the respondents in the study communities was the conservation of the natural environment in the host communities. Some (75.0%) of the respondents also

indicated that eco-tourism attractions beautified the environment while 46.6% of them also said that eco-tourism attractions provide habitats for and increase the population of some wildlife species. The fact that eco-tourism serves as a climate change mitigation strategy was not left out as 40% of the respondents mentioned that the weather condition around or closer to these areas was different from other places (Table 4). Table 5 shows the environmental impacts of the eco-tourism.

A GTA of Kassena-Nankana District supported the fact that diversity begets biodiversity and developing eco-tourism brings a lot of benefit to biodiversity conservation when he said:

“Eco-tourism attractions provide habitats for so many environmental species like birds, mammals, and all kinds of trees. If any of the other potential areas are developed, they can also serve as a home for other species and before we realize it, the places would turn into a heterogeneous society of species.”

Despite the positive environmental impacts of eco-tourism, the negative ones were also unearthed by the study. The majority (80.6%) of the respondents postulated that eco-tourism in their communities pollutes the environment due to human intrusion. Others (70.0%) also mentioned that it brings about land degradation due to infrastructural development and 35.6% of the people indicated that eco-tourism leads to a reduction in their farmlands due to the development of infrastructure. However, a few (11.7%) of the respondents did not see

Table 6. Pearson correlation analysis.

Correlations matrix		The wage of tourism stakeholders	Usage of income earned from tourism activities
The wage of tourism stakeholders	Pearson correlation	1	0.699**
	Sig. (2-tailed)		0.000
	N	207	207
Usage of income earned from tourism activities	Pearson correlation	0.699**	1
	Sig. (2-tailed)	0.000	
	N	207	208

** Correlation is significant at the 0.01 level (2-tailed).

Source: Field Survey (2021).

any negative impact of eco-tourism in their communities. The Planning Officer of Talensi District indicated that:

“..... there has been land degradation and other negative environmental activities going on in the host communities currently by the indigenes and it might be very difficult to say that tourists responsible for the degradation of land”.

In terms of the degradation of the land, the respondents argued that, so much land is required to build eco-tourism infrastructures like roads, restaurants, car parks, resting places, and other facilities. This, according to them, would bring community development but would go against the environment that eco-tourism is based on. Although tourists' visitation has been found to increase the rate of littering in host communities (Amuquandoh, 2010), the survey shows that sanitation management in the selected tourism destination sites is not much of a problem. Observations revealed that there is quite a good control in terms of the disposal of waste generated from the activities of eco-tourism including the business operators. About 69.4% of the respondents also attested to this fact. Table 6 shows the wages of tourism stakeholders while Table 7 shows the pearson correlation analysis of the beautification of the environment and conservation of the environment.

The Pearson correlation reveals that there is a very high positive relationship between beautification of the environment at tourism sites and conservation of the ecosystem [$r(207) = 0.909, P=0.000$]. This depicts that an increase in a unit of environmental beautification at the tourist sites will lead to a significant increase in ecosystem conservation within the tourist sites. Hence, we fail to reject the null hypothesis that the association between environmental beautification and ecosystem conservation is zero.

There are always natural resources and other important features in every eco-tourism project that serve as the promotional package for their entire development (Agyei-Ohemeng et al., 2018). The eco-tourism attractions

covered in this study – are Paga Crocodile Pond, Pikowro Slave Camp, Sirigu Pottery and Basketry, Tengzug Shrine, and Dua-Apatanga – combine various natural, cultural, historical, and mythical features as their promotional packages. As it was noted by UNEP and TNC (2014), eco-tourism is a major activity and economic force that contributes (directly or indirectly) to rural livelihoods. The result of this study has revealed that the main source of livelihood in the tourism destination communities is food crop farming followed by direct and indirect employment in eco-tourism businesses. The employment avenues were opened to everyone in the fringe communities without any segregation. However, the majority of those undertaking trading activities were women. Household members engaged in eco-tourism businesses earned a monthly income of, at least, GHS300.00. Analysis of the incomes earned from eco-tourism further revealed that 53% of those engaged in the activities earned more than the national monthly minimum wage of GHS375.90. The income generated from these businesses is used to meet households' basic needs including investing in food production, the building of residential facilities, payments of school fees, settlement of medical bills, and performing funeral rites. This result corroborates the findings of Stone and Nyaupane (2016) that local communities where eco-tourism sites are located benefit from the tourism value chain, and Sandbrook and Adams (2012) that revenue from the operation of eco-tourism businesses in a rural area is used by households as a livelihood support mechanism. According to (Afenyo, 2011), the economic impacts of eco-tourism cannot be underestimated in rural communities, but these impacts are not one way since it brings both negative and positive impacts to local communities. In this study, the negative impacts were seen as the cost (adverse externalities) of developing eco-tourism projects, such as increased cost of living in rural communities, loss of farmlands, and competition from large-scale businesses.

As noted by Kiper (2013), eco-tourism aims to conserve resources, especially biological diversity, and maintain

Table 7. Pearson correlation analysis.

Correlations matrix		Beautification of the environment	Conservation of the environment
Beautification of the environment	Pearson correlation	1	0.909**
	Sig. (2-tailed)		0.000
	N	203	72
Conservation of the environment	Pearson correlation	0.909**	1
	Sig. (2-tailed)	0.000	
	N	72	75

** . Correlation is significant at the 0.01 level (2-tailed).
Source: Field Survey (2021).

sustainable use of resources, which can bring ecological experience to travelers, conserve the ecological environment and gain economic benefits. Also, according to Alsterberg et al. (2016), habitats in a heterogeneous ecosystem complement each other both in terms of the species present and their physical structure. Some positive ecological impacts of eco-tourism identified in this study are environmental conservation, mitigation of climate change, beautification of the environment, and an increase in species population. However, the ecological impacts were both positive and negative, as indicated by Stronza and Godillo (2008). The results indicate that there have been landing degradation and other negative environmental effects in the host communities currently. But, according to a key informant, it might be very difficult to say that tourists cause negative environmental impacts on the natural resources that attract them. This goes to affirm the position of Sharpley (2006), who argued that there are serious difficulties in pinpointing the negative environmental impacts of eco-tourism because it may not be clear whether the impact is caused by the tourists or other livelihood alternatives and that there is a lack of references to measure the consequences of eco-tourism on the environment (Aksoz and Bac, 2012). According to Dologlou and Katsoni (2016), there is no bad eco-tourism because the majority of the bad practices do not follow the principles of eco-tourism. Not only has that, the findings further indicated that there is some level of environmental management in the eco-tourism sites. There is adherence to good sanitation practices to safeguard the ambient quality of the environment. The results also indicate a positive relationship between environmental education of tourism stakeholders and waste generated at a tourist site and the level of tourism patronage.

Conclusion

The paper is focused on environmental and economic impacts of eco-tourism in Upper East region of Ghana by taking into consideration the nature of eco-tourism

attractions, households' engagement in eco-tourism related activities, economic impacts of eco-tourism, and environmental impacts of eco-tourism. The following conclusions are drawn from the study.

Firstly, eco-tourism sites considered in this study are the Paga crocodile pond, the Pikowro slave camp, the Sirigu pottery and basketry, the Tengzug shrine, and the Dua-Apatanga rocks. It is disclosed in the study that, the sampled eco-tourism sites are of ecological, cultural, historical, and mythical significance.

Also, the study revealed that, only a smaller fraction of households are engaged in eco-tourism activities. Households and stakeholders of the tourism industry practice eco-tourism activities such as; tree planting to replenish the lost ecosystem and the passing of by-laws to curb poaching of the crocodiles in the Paga crocodile Ponds and to also protect the Pikowro slave camp.

The findings further indicated that eco-tourism has some positive impacts on the lives of households living in the fringe communities of the attractions. There are several ancillary sources of income from eco-tourism, such as the sale of tourism products like baskets, hats, locally produced sandals, tour guarding, and transportation, which have been promoted due to the influx of tourists to the destination sites. The direct beneficiaries include those natives employed and paid by the eco-tourism facilities while the indirect beneficiaries consist of stakeholders who engage in the production and sale of tourism products and services within the supply chain in the destination sites. The engagement of households in eco-tourism business activities has helped to leverage their poverty levels as many of them use the income earned to pay school fees, medical bills, and the building of their homes.

The study also revealed positive and negative environmental impacts of eco-tourism. The positive environmental impacts are mitigation of climate change, increase in population of wildlife species, conservation of the environment, beautification of the environment, and provision of ecosystem services. However, the responses suggest that, the major positive environmental impacts are conservation of the environment and beautification of

the environment. Eco-tourism will help conserve the natural environment and it is seen as a means of boosting economic activities and creating employment opportunities in the host communities, which constitutes the basis for sustainable development. This is because the present generation would meet their needs while conserving the environment for future generations.

On the other hand, the negative environmental impacts of eco-tourism are environmental pollution, land degradation, bad environmental practices, and reduction in farmlands. However, based on the responses, the most significant adverse environmental impacts are environmental pollution and land degradation.

Recommendations

The Government of Ghana should provide training and financial support to industry players engaged in the sale of eco-tourism products as a measure of improving revenue generation in the sector's activities.

There is also the need for stakeholder collaboration of players in the industry of eco-tourism to sensitize the masses on the need for the preservation of eco-tourism sites in the Upper East Region. The Government of Ghana should develop eco-tourism sites in the Upper East Region in order to boost local and international tourism so as to increase revenue generated from tourism.

To sustain eco-tourism development in Upper East Region, the study recommends that district/municipal assemblies and GTA should embark on promotional marketing activities to increase patronage by tourists.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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