

SUSTAINABLE TOURISM TO REMEDY LAND DEGRADATION IN GHANA ALONG THE BLACK VOLTA RIVER

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ABSTRACT

The aim of this paper is to assess the impact of sustainable tourism on livelihoods of the implementing community members. The specific focus is the conservation option of zero land degradation approach of the Wechiau Community Hippopotamus Sanctuary (WCHS) that has conserved the gallery forest along the Black Volta River over the past 16 years. The study methods involve collection and analysis of primary and secondary data, with regards to number of visitors and the study area's satellite images of 1986, 2000 and 2016 respectively. Results indicate provision of school infrastructure, scholarships, solar lamps for 600 households and 13 boreholes. The rest include rise in tourism income, supply of variety of seeds for cropping and realization of good production. Farming livelihood is inadequate; so farmers add petty trading, brewing and processing of organic shea butter. In conclusion, tourism is not always destructive to the natural environment. In this case, tourism remedies land degradation.

Keywords: Sustainable Tourism, Land Degradation, Gallery Forest, Hippopotamus, Volta River, Conservation

INTRODUCTION

The importance of the tourism industry to the global economy is shown severally. It accounted for 9.8% of world gross domestic product (USD 7,170.3 billion) and some 283,578,000 jobs (9.5% of total employment) in 2015 (WTTC, 2016). It increased to USD 7,613.3 billion (10.2% of GDP) directly supporting 292,220,000 jobs (9.6% of total employment) in 2016 (WTTC, 2017). Further significance of tourism considers its role as a tool to achieving socio-cultural, economic and ecological sustainability as well as UN's recognition of the part sustainable tourism has to contribute towards attainment of the Sustainable Development Goals (SDGs) (Ashok et al., 2017). With the many development sectors in developing countries, the tourism sector is the only one that offers surplus returns, making it the second largest foreign exchange earner in 49 underdeveloped countries (Wood, 2004). Briefly, sustainable tourism refers to indefinite sustenance of current and future socio-cultural, economic and ecological tourism activities. The socio-cultural aspect entails community wellbeing, cultural assets, community participation and tourist satisfaction. The economic component involves benefits, tourism product, leakages and seasonality. Ecological protection and management of valuable natural assets as well as resources, particularly, water, energy and waste form the third part (UNWTO, 2006). Although, sustainable tourism is to deliver the triad sustainability, there is empirical evidence from the Coral Triangle Region of Asia to show that sustainable tourism positively delivers on only economic sustainability and fails to deliver on social and environmental sustainability (Huang and Coelho, 2017). This failure implies environmental degradation of the ecological basis of sustainable tourism. In this regard, society adversely impacts on the ecology.

An attempt to remedy the environmental degradation involves the interplay of sustainable tourism and land degradation, which is the concern of this paper. Land degradation is recognizably a broad concept embracing desertification, biodiversity loss and relating to climate change and reduction in food security (Gisladdottir and Stocking, 2005, Boer and Hannam, 2015). It connotes the idea of land (terrestrial ecosystem) progressively becoming worse off in quality; "reduction or loss of ecosystem services, notably the primary production services" (Stocking and Murnaghan, 2001, Safriel, 2007:2, Bai et al., 2008, Peprah, 2014, Peprah, 2015). The trend is worrying considering the dependence on the land for provision of essential resources for human survival on the planet Earth (Millennium Ecosystem Assessment, 2005, Boer and Hannam, 2015). A critical importance of reducing land degradation is that "soils are a key enabling resource, central to the creation of a host of goods and services integral to ecosystems and human well-being. The maintenance or enhancement of global soil resources is essential if humanity's overarching need for food, water, and energy security is to be met" (FAO, 2014:2, Boer and Hannam, 2015:1). Also, the success or attainment of three SDGs are based on reduction in land degradation. These are "stop loss of biodiversity by 2020, to limit global warming to 2° Celsius and to ensure everyone's access to enough food" (Boer and Hannam, 2015:2, Heinrich Boll Stiftung, 2015:48). A remote response to land degradation by the international community is the 1977 United Nations Conference on Desertification (Dregne, 1986). In recent times, the most significant response to the menace of land degradation is the United Nations Convention to Combat Desertification (UNCCD) since 1994. About two decades later, the most commonly reported claim is that the situation has become worse (UNCCD, 2012, Welton et al., 2014). However, a lot has been done in terms of gathering scientific knowledge on land degradation in the past 20 years.

The literature is once again dotted with figures illustrating the worsening situation. Welton et al. (2014:1) highlight "continuing land degradation will drive 700 million people out of their homes; ... 52% of drylands currently under agricultural cultivation are moderately or severely degraded, 12 million hectares of productive land become barren each year due to desertification and

drought” and, “each year an estimated 75 billion tons of fertile soil are lost”. Desertification, land degradation and drought (DLDD) directly affect 1.5 billion people globally (UNCCD, 2012:11). According to Gibbs and Salmon (2015:12) global degraded land varies from “less than 1 billion ha to over 6 billion ha”. The implication is obvious; land degradation still poses a serious threat to the achievement of sustainable environment.

Already a suggestion by the UNCCD is that, ‘the enhanced implementation of the Convention is critical for our future survival’ (UNCCD). Following this, the Conference of Parties (COP 10) of UNCCD has stressed the need to achieve the goal of ‘Land Degradation Neutral World’ (LDNW) which was also captured in the ‘Rio+20’ conference report. Recently, the UNCCD secretariat pushed for a more concrete target of the goal ‘Net Zero Land Degradation’ (NZLD) by 2030 which is included in the SDGs (Welton et al., 2014). The SDG 15 states: ‘protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss’. The specific target 15.3 states: ‘by 2020, combat desertification, and restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation neutral world’.

With regards to ‘Land Degradation Neutral World’ (LDNW), the UNCCD has explained, this “neutralizing” of land degradation would come about through “a global shift in land stewardship such that degradation of new areas is avoided, and unavoidable degradation is offset by restoring an equal amount of already degraded land in the same time and in the same ecosystem’ (Welton et al., 2014:2). “The ‘net’ means that degradation in one place can be offset by restoration somewhere else” (Heinrich Boll Stiftung, 2015:48). There is global focus on restoring degraded lands because the outcome will increase land available for provision of agricultural goods (Gibbs and Salmon, 2015). The analysis of WCHS case which tries to equate anthropogenic land degradation to zero in the conserved gallery forest is a contribution to this debate. Should the alternative uses of the forest garner benefits commensuration to the opportunity cost of the controlled uses, then, the zero land degradation argument is worth replicating. This paper contributes observed social, economic and environmental evidence from conserved gallery forest to the net zero land degradation debate. Land degradation neutral fund has been established to aid the implementation of LDNW. Among other issues, conservation is one of the targeted sectors with a link to sustainable construction of infrastructure for eco-tourism (UNCCD, 2015).

In 1999, Wechiau Community Hippopotamus Sanctuary was created through the collaboration of four individuals, two organizations and three community chiefs. The individuals were John Mason, Brian Keating, Alex Graham and Donna Sheppard; the organizations include Nature Conservation Research Center (NCRC, Ghanaian NGO) and Calgary Zoo (Canadian); and, the chiefs of three communities: Wechiau-Naa, Gurungu-Naa and Tokali-Naa. It began with some principal guidelines such as community participation, ownership and incentives, community conservation reserve (protected area) of 5 km width and 40 km length along the Black Volta River near Wechiau, ban on all human activities within the protected area (zero land degradation), resettlement of communities within the reserve, Calgary Zoo to provide funding as well as conservation management, and NCRC provided technical and professional advice. Funding was sourced in 2006 and implementation started. The coordinates of the river portion of the sanctuary are 09° 51’ north and 02° 44’ west and 09° 38’ north and 02° 44’ west for northern and southern boundaries respectively.

The aim of this paper is to assess the impact of the implementation of zero land degradation approach on the livelihoods of the people involved in the community-based gallery forest conservation of the Wechiau Community Hippopotamus Sanctuary in north-west Ghana. The theory of Triple Bottom Line (TBL) is adopted to analyze social, economic and environmental sustainability. This paper is divided into five sections beginning with introduction. The second section (literature review) explains theoretical reference using the theory of TBL. It reviews the nexus of sustainable tourism and land degradation. The method of study is discussed as the third section in addition to the study area of seventeen communities involved in the conservation as well as the description of the Black Volta Basin. The fourth section puts study results and discussion together under three sub-headings of social, economic and environmental sustainability. The final section draws conclusions from the study.

LITERATURE REVIEW

The proponents of Triple Bottom Line (TBL) discussed environmental “AccountAbility” and “SustainAbility” as well as three (3) “Ps”, profit (economy), people (society) and planet (environment) drawn from “Our Common Future” (UNWCED, 1987, Elkington, 1997, Stoddard et al., 2012). The main principle remains the same till today that the current generation do not reduce the social, economic and environmental resources and development options open to the present and future generations. The TBL literature has been articulated by many: benefits accrue to TBL compliant businesses (Tschopp, 2003), sustainability reporting based on simplicity, practicality and usefulness (Hubbard, 2009), market value co-creation (Penaloza and Mish, 2011), unique opportunities offered by TBL as well as its misuse (Tyrrell et al., 2012).

With regards to the application of TBL in tourism studies, economic sustainability has been the success story with socio-cultural and environmental sustainability being problematic (Rodary, 2008). Economic sustainability of tourism is considered as “tourism imperative”. In product-led tourism, environmental concern is a secondary matter. Also, in environmentally-led tourism, environmental stewardship and conservation are the main priorities. And, in neotenus tourism, there is absolute preservation of environment and resources. To measure the four tourism-led scenarios, the following indicators were put forward: population dynamics such as migration, unemployment rate and per capita income; tourism maintenance of quality and ecological monitoring; ecological carrying capacity of airport, attraction sites, drinking water, sewage, protection of species, use of protected areas as well as pollution and emissions (Lorant and Zoltan, 2008). One area that is yet to receive much attention in the academic literature is the orientation of the TBL as a community assessment (Rogers and Ryan 2001). This current paper contributes to filling the gap.

The economic component is easily measurable; while, social and environmental sustainability are difficult to quantify. Hence, the over concentration on economic sustainability which the ethical economy argument came to contest. Heads of beds in hotels and visitation to tourism destinations are the main features of economic sustainability. Social sustainability, however, emphasizes on social capital towards the attainment of individual or social wellbeing, employment experiences and satisfaction. Indicators of environmental sustainability are forest, minerals, fish, soil, energy use, use of recycled waste as well as water sources drawn from the natural capital (Stoddard et al., 2012).

Field work experience indicates the difficulty in separating TBL in tourism studies as biodiversity conservation, community (society) and economic development are interwoven and mutually reinforcing. Hence, TBL in tourism application stresses on interdependence, synergies and cross disciplinary influences of the sustainability triad. The economic aspect of entrance fee brings in the issue of how much of that income is put back to support conservation (environment aspect). The social aspect such as visitation equally impacts the natural environment but to what extent in terms of percentages. In quantitative terms, how do tourists' activities impact on wildlife, vegetation, water quality and soil (Wood, 2004).

When tourism is mentioned in relation to land degradation, often, the mind quickly jumps to negative impacts caused to land from the construction of tourists' facilities. In this regard, tourism is immediately linked to speeding up of soil erosion, increased pollution, natural habitat loss and increased risk and pressure placed on endangered species and forest fires. In addition, tourist numbers are linked to carrying capacity concept of tourist site in which resultant impact is often degradation of the very resources which created the tourists' attraction (Sunlu, 2003). Also, there is reciprocal threat from land degradation of tourism-based ecosystems and natural environment on tourism industry (Neto, 2002). There are instances where even ecotourism does not benefit conservation nor host communities as is the case in the protected areas of India. Wildlife tourism in protected areas of India in many instances do not adhere to reduction in environmental impacts, revenue generation, benefit sharing with host communities and environmental education for tourists (Banerjee, 2010). It is not only in India that tigers are poached. Elsewhere in the tropics, local people depend on hunting of wildlife for food (animal protein) and animal trophies mainly from mammals, birds and reptiles. Mammals (ungulates, primates and rodents) are preferred due to the overall biomass. Hunting in tropical forest is no longer sustainable resulting in extirpation and reduction in wildlife densities. If wildlife harvesting is to be sustained, relevant institutions in wildlife management would need to be strengthened. One approach to remedy the situation is community-based wildlife conservation. Partnership between communities, government and non-governmental organizations does better in wildlife conservation (Robinson and Bodmer, 1999). Wildlife health indicators include absence of disease, resiliency and sustainability (Hanisch et al., 2012).

In this present paper, the thinking is different. Sustainable tourism is viewed as pre-emptive measure to land degradation. The wildlife involved is hippopotamus; and, the conservation of a buffer forest on the Ghana side of the Black Volta River of 5 km width and 40 km stretch in length as feeding grounds for the two remaining hippopotamus population in Ghana with a ban on any form of human activity within the buffer (Sheppard, 2010). Sustainable tourism of hippopotamus viewing is created to generate funds for community development. With time, it is expected that birds viewing and other cultural tourism activities will add up. About 237 birds, 226 plants, 50 mammals, 32 reptiles and nine amphibians are hosted by WCHS (Sheppard, 2010:271). Similar situations are found in Laikipia District in Kenya where private people have come together to manage wildlife and ranches to the benefit of over 300,000 Laikipian people, 40 tourism enterprises, spreading environmental education among tourists, managers, communities members and scientists. The landscape is managed on supervised grazing ensuring conservation of plants, cattle and wildlife. Conservation areas are created, particularly, areas rich in wildlife diversity, generating employment and "conservation fees" for the participating private ranches. However, group ranches managed by the Masai threatens the private conservation success with overgrazing and charcoal production. The few bright conservation spots in group ranches are heavily dependent on donor support. Overall, the income generated matches up to what the extractive land-uses would have generated (Sundaresan and Riginos, 2010). The move to ecotourism stresses on conservation and securing

of wildlife as the notion belongs to conservation circle and not tourism although the tie between the two is the most innovative experience and practice. The stakeholder approach adopted favours local communities in bringing new opportunities (Rodary, 2008).

To be successful in the protection of both sustainable tourism and the natural environment, there is the need for comprehensive and scientific planning, adherence to environmental impact assessment and establishment of conscious ecological environmental protection (Wang et al., 2014).

METHODS OF STUDY

The study area, Wechiau is the capital of Wa West District and is located on the intersect of latitude 09°49'762 N and longitude 02 ° 40'965 W; in some 42 km southwest of Wa, capital of Upper West Region (Asase et al., 2005). To the north-west of Wa West District is Nadowli-Kaleo District, Northern Region to the south, Wa Municipal to the East and Burkina Faso to the West. Specifically, the District is located within longitudes 9°40'N and 10°10'N and latitudes 2°20'W and 2°50'W with the total land area of 1,856 km² and five area councils containing 208 communities. The area councils are Dorimon, Ga, Gurungu, Vieri and Wechiau. The profile of the Wa West District shows a relief of 180 m to 300 m elevation, with three different soil types of Leptosols, Lixisols and Vertisols. It has a drainage system formed by the Black Volta River and its seasonal tributaries. The general climate is the interior savanna climate also called tropical continental climate with annual rainfall of 1,000 to 1,150 mm and temperature range of 9°C, that is, 36 °C in March and 27 °C in August. Rainfall is single maximum occurring in May to October (Dickson and Benneh, 1988). The vegetation is guinea savanna made up of tussock grass and deciduous trees as well as fire resistant trees. Common trees include as Shea (*Vitellaria paradoxa*), Dawadawa (*Parkia biglobosa*), Kapok (*Ceiba pentandra*), Baobab (*Adansonia digitata*), Mahogany (*Khaya snegalensis*), Cashew (*Anacardium occidentale*), Mangoes (*Mangifera indica*), Akee apple (*Blighia sapida*), Guava (*Psidium guajava*), Teak (*Tectona grandis*) and Neem (*Azadirachta indica*). The population of the District stands at 702,110 with 48.6% (341,182) male and 51.4% (360,928) female (Ghana Statistical Service, 2012).

The Black Volta River has the total catchment area of 142,056 km² with some 23.5% (33,302 km²) located in Ghana. The Black Volta basin receives annual rainfall of 1,023.3–1,348 mm with a coefficient of variance of 0.17–0.23, pan evaporation of 2,540 mm and potential evapotranspiration of 1,450–1,800 mm. It has a mean flow 103.75-139.55 m³/s with mean annual flow of 3.27- 4.40 10⁹m³. Aquifer recharge of the Black Volta basin is 205 mm with replenishable groundwater capacities 3.4 x 10⁹m³. The basin suffers slight to moderate sheet erosion. Human population growth rate has been decreasing from 3.4% (1960-1970), 3.3% (1970-1984) and 1.2% (1984-2000) (Barry et al., 2005). Figure 1 depicts the map of the study area.

The study used mixed methods research approach. Both primary and secondary data comprising qualitative and quantitative data were collected and analyzed. Descriptive statistics populating frequencies and percentages were employed from Statistical Package for the Social Sciences (SPSS). The study intended to interview six residents per each of the 17 communities making a sample size of 102 with equal male and female representation following the population dynamics of the area; however, 94 respondents took part in the questionnaire administration from 16 communities. Questionnaires were administered to individuals, hence, privacy was guaranteed for respondents to express candid opinions involving the use of three research

assistants. The questions focused on livelihood activities, benefits gained from WCHS, farm sizes, crops grown and reasons for farming, impact on WCHS as well as attacks on the hippopotamus. It was supplemented with three key informant interviews (WCHS manager, Wa West District Assembly representative and an opinion leader) and one focus group discussion at Wechiau where group opinions were solicited. Secondary data on number of visitors over the years as well as income accruing from payment of entry fees were collected from WCHS management. Three satellite images for 1986, 2000 and 2016 based on availability for downloading from United States Geological Survey (USGS) website were manipulated in Erdas Imagine using supervised classification. Dominant classes were reduced to four and the various sizes in hectares (ha) and percentages were produced for presentation and discussion. The study methods have a lot in common with the previous studies on tourism and environment relationships in protected areas (Wang et al., 2014).

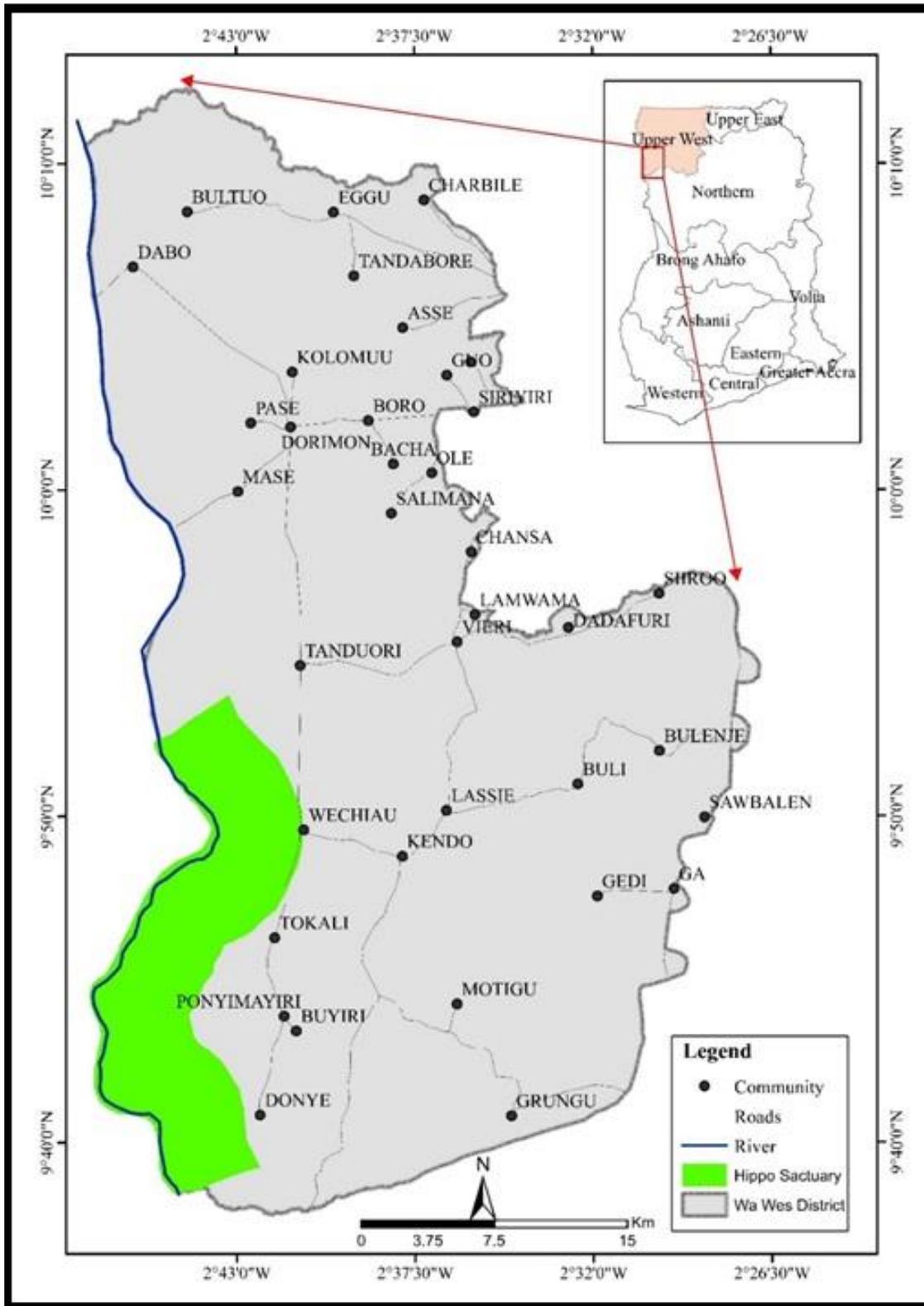


Figure 1. Map of the Study Area, Wechiau Community Hippo Sanctuary

RESULTS AND DISCUSSION

This section presents results of the study and discussion. It is sub-divided into three: social, economic and environmental sustainability.

Social Sustainability

The seventeen communities constituting WCHS include Wechiau which host both the Wa West District office and the sanctuary office. The rest are Tokali, Bulinche, Teme, Peplinkpari, Telewona, Tambligie, Dogberipari, Tankara, Dodobe, Donpire, Dornye, Dochere, Nwaaleyiri, Kantu, Kpanfa and Tuole. Visits occur mainly in four communities namely Wechiau, Kpanfa, Kantu and Telewona. The Canadian founding partners provided three classrooms made of cement blocks for the upper primary, furnished with tables and chairs, separate house accommodation for the school's head teacher, teaching and learning materials as well as reading and writing materials. Some sports equipment were provided including footballs, volley balls and nets as well as sportswear. Two educational funds were also set up and 15 students have benefitted by continuing their education in high schools outside the WCHS. Local health facilities provided by the Government of Ghana have benefited from donations of hospital equipment. Relating to health is the provision of borehole water for thirteen of the communities to replace reliance on the Volta River for domestic water. The WCHS can boast of a house, three urinals, three toilets, 10 boats, three hippo hides, a visitor's lodge at Telewona and visitor's centre at Wechiau. Some 600 households within the 17 communities have been provided with solar lamps. Presently, Wechiau has a police station to help provide security for local residents and tourists as well. A number of private sector fuel (gas) stations have been established to serve the fuel needs of motorists. The WCHS is partnering with Forestry Commission – the Ghana Wildlife Division, Ghana Tourist Authority and USAID – Feed the Future Project as well as Savannah Fruits Company which purchase organic shea nuts from the WCHS communities.

Economic Sustainability

The WCHS directly employs 47 persons as including the manager, care taker, driver, ten rangers, ten tour guides and twenty river guides or boatmen. Figure 2 shows the fluctuating nature of tourists' visit to WCHS. Generally, visits by both domestic and international tourists are increasing as shown by the equations: $y = 53.818x + 382.66$ and $y = 27.582x + 390.81$ for domestic and international visits respectively. At the beginning of WCHS, international visitors dominated the visits (2001, 2002 and 2003). Ghanaians' interest and patronage grew with regards to number of visitors. Ghanaian residents provided more visitors to the site than non-resident visitors with the exception of 2005. The non-resident visitors come from three main continents: Americas (18%), Africa (36%) and Europe (46%).

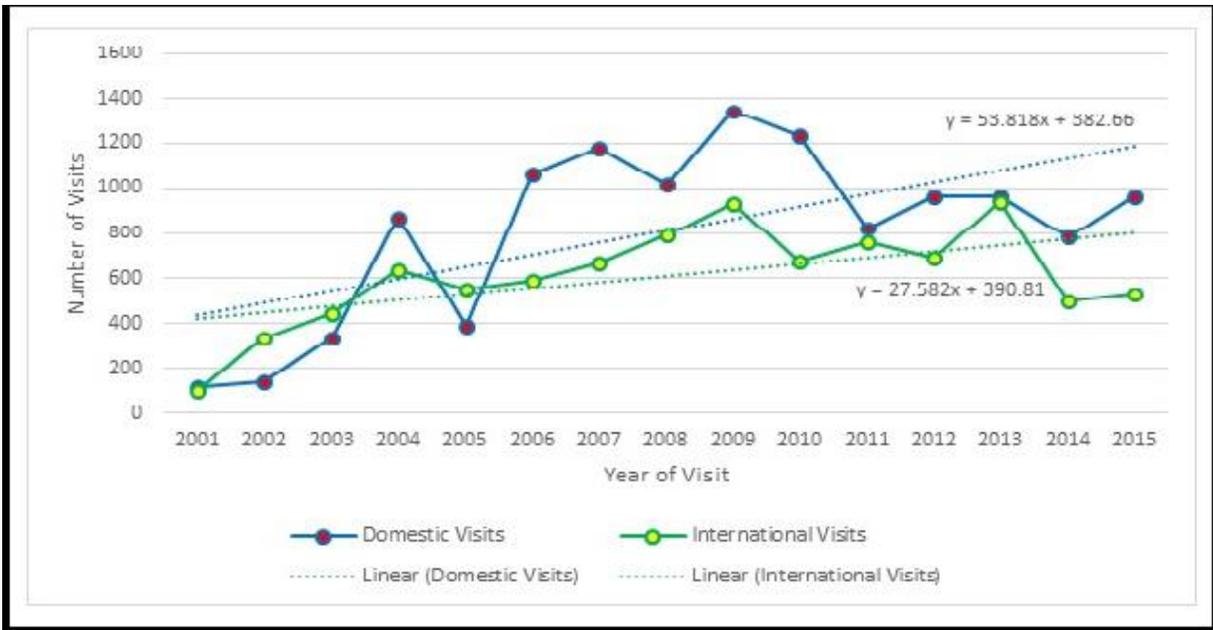


Figure 2. Domestic and international visits to WCHS (2001-2015)

Source: Management of WCHS (2016)

Figure 3 shows the financial trend from proceeds of entry fees. There is progressive increase as shown by the trend line equation of $y = 1716.5x - 3446.2$.

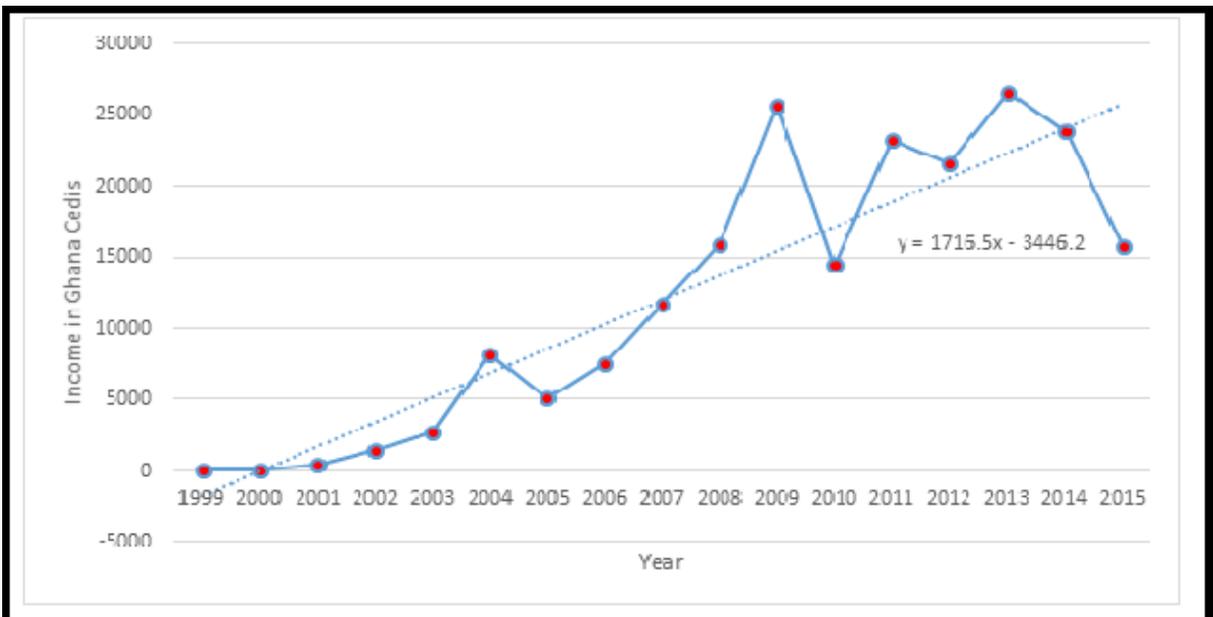


Figure 3. Annual income accruing from entry fees to WCHS (1999-2015)

Source: Management of WCHS (2016)

The major occupations of the community members include farming (42.6%), fishing (7.4%), petty trading/commerce (16%), tourist tour guiding (5.3%), Teaching (7.4%), sanctuary wage workers (9.6%) and miscellaneous jobs (11.7%) in which (n=94 respondents). As regarding farming, 17% considered average farm size to be less than one hectare, 55.3% reported of mean farm size of one-to-three hectares, 20.2% claimed some farm sizes are within six-to-ten hectares and 7% reported of farm sizes above ten hectares. Farmers grow mainly food crops notably maize (*Zea mays*), sorghum (*Sorghum bicolor*), millet, rice, cowpea, soya beans (*Glycine max*), groundnut and Bambara beans (*Vigna subterranean*). The responses indicate that majority of the farmers (75.5%) practise farming to feed the farming family, 18.1% responded that farming is only for sale of farm produce while 6.4% claimed farm produce are for both sales and household consumption. Petty trading or commerce involves the buying of maize from farmers and retailing, selling of manufactured goods, shea butter processing, pito brewing (local beverage brewed from sorghum), brewing of local gin, livestock trade, cement retailing, dress making and food vending. Respondents considered the following economic activities as unsustainable: bush burning for hunting (39.4%), charcoal production by charring wood (37.2%), poaching of the hippopotamus (21.3%) and others (2.1%) where (n=94 respondents). Local fishing is very prominent at Teme and shea butter processing at Bulinche.

Environmental Sustainability

Figure 4 shows analyzed satellite images of three years: 1986; 13 years before the establishment of the conserved area, 2000 a year after the conservation and 2016; 15 to 16 years after conservation. In 1986, the water mainly the Black Volta River constituted 285 ha (1.7%), closed vegetation 9,273 ha (56.5%), shrubs and grassland (6,665 ha – 40.6%) and built up (179 ha – 1.1). In the year 2000, water size was 389 ha (2.4%), 6,697 ha – 40.9% for closed vegetation, 9,079 ha - 55.4% for shrubs and grassland and 222 ha – 1.4 for built up area. In 2016, water had 365 ha – 2.2%, closed vegetation 6,381 ha – 38.9%, shrubs and grassland 8,868 ha – 4.7% and built up area was represented by 773 ha – 4.7%.

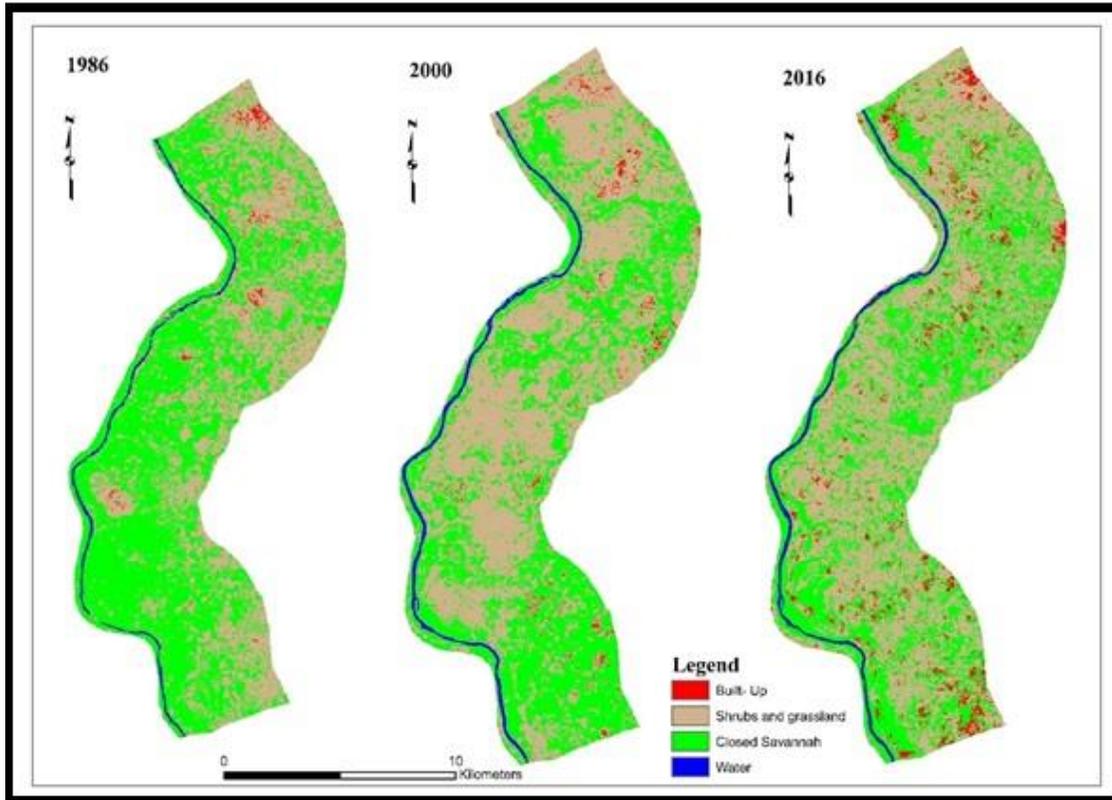


Figure 4. Remotely sensed land cover images of WCHS FOR 1986, 2000 and 2016 downloaded from USGS and manipulated in Erdas Image and exported to ArcGIS

Figure 5 shows the land cover change between 1986 to 2000 and 2000 to 2016. Between 1986 and 2000, the size of water increased by 105 ha but there was decrease in water size of -24 ha from 2000 to 2016. Closed forest decreased by -2,576 ha from 1986 to 2000 and -316 for 2000-2016. Shrubs and grassland representing savanna in the gallery forest increased by 2,414 ha for 1986-2000 and decreased by -211 for 2000-2016. Built up area representing human settlements increased by 44 ha for 1986-2000 and continued with the increase of 551 ha for 2000-2016. Closed vegetation, mainly trees, continue to decrease after the conservation but the rate of decrease has declined drastically indicating that conservation of the gallery forest is paying good dividends. Shrubs and grassland within the conserved area is also decreasing, a good thing observed from the conservation. Human numbers are increasing and settlements are expected to increase alongside. However, it could be seen that the increase in settlement along the gallery forest is not adversely affecting the conserved area. The decreasing area covered by water is the only worrying situation. In the specific case of water, further investigation is required.

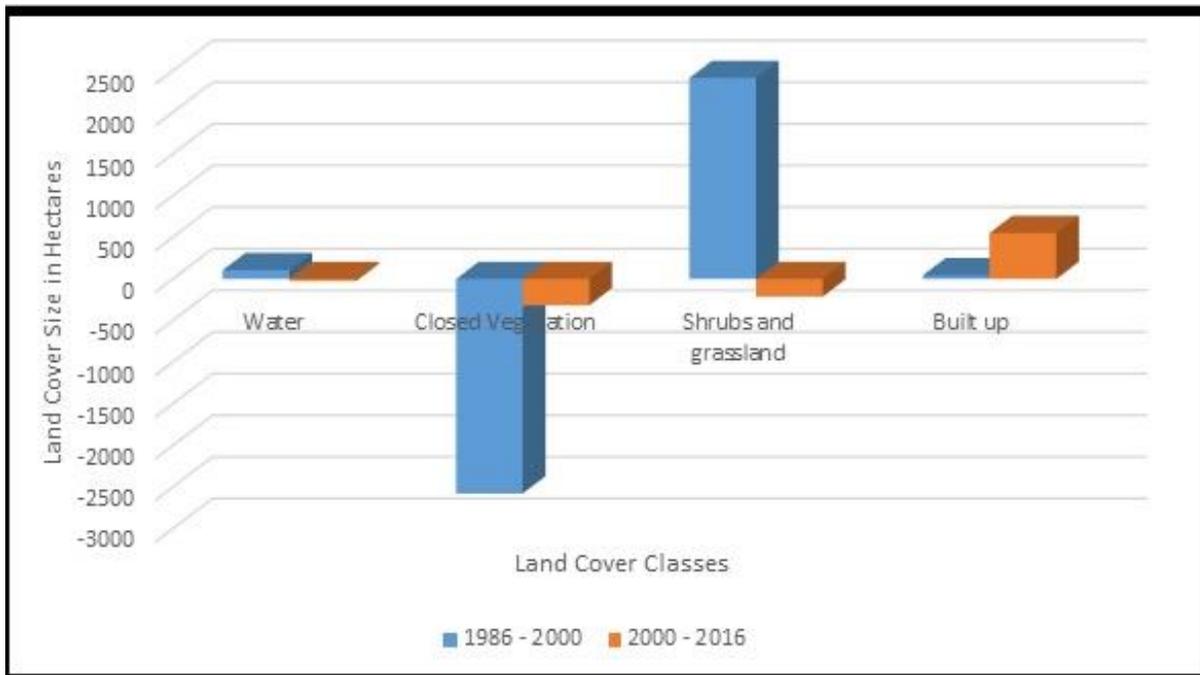


Figure 5. Land Cover Change between 1986 to 2000 and 2000 to 2016

CONCLUSION

This paper contributes to TBL through the following indicators: social sustainability is measured by improvement in the host community's formal education and sporting activities, community health, drinking water supply, and lighting as the remote host communities are not connected to national electricity grid. Economic indicators are entry fees associated with the number of visitors and growth in local businesses, particularly, processing of shea nuts into shea butter for sale. The environmental indicators include the major land cover class performance gains made in the closed vegetation and reduction in grassland within the protected area. The communities have managed to do with the alternative uses of the conserved gallery forest. So far, there is no agitation to re-use the conserved forest or wilful attempt to dis-respect the ban on human activities in the forest. However, there is local fishing activity considered illegal but it is happening on a very small-scale.

As regarding land degradation neutral world, the sustainable tourism approach of the WCHS project presents positive results. Some patches of grassland and shrubs as found in the 2000 image have been replaced by closed tree vegetation. The implication of ban on tree harvesting appears to be responsible for the gains in the closed vegetation. The remaining threat that works against attaining improvement in land cover is the perennial bush fires and charcoal production. A further study is required to analyze land cover of the non-protected areas. Also, there is the need to implement other sustainable land management practices such as natural growth and regeneration of vegetation plus the use of no fires for farmland preparation. These practices are ongoing at the Lawra District of the same Upper West Region and could be adopted to augment the WCHS example.

Tourism does not always kill tourism. It is not all the time that tourism activities destruct the natural environment on which tourism is founded. Tourism does not exacerbate land degradation continuously. And, it does not repeatedly deliver only the tourism imperative (economic sustainability). In the specific case of WCHS, sustainable tourism is sustaining tourism as popularity of WCHS continues to increase locally in Ghana and internationally. Sustainable tourism is attaining social, economic and environmental sustainability with special reference to WCHS amidst threats from charcoal production, wildlife and poaching of hippopotamus.

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