The Impacts of the Bui Dam Project in Ghana on Residents Waterbase Recreational Pursuits within the Catchment Area

Baffoe Kingsley[1], Alex Boakye Asiedu[2]

[1,2]*Department of Geography and Resource Development, University of Ghana, P.O. BOX LG 59 Legon, Accra, Ghana.*

***Abstract*: - This paper explores how the construction of large dams affects the leisure and recreational (LR) pursuits of residents living in the catchment area. The mixed-method technique was used due to its inherent strengths (Castro et al, 2010; Teye, 2012) in which 200 respondents were sampled using a multistage procedure. The study revealed that before the Bui Dam Project (BDP) the river was the recreational base for both local residents and tourist. Unfortunately, post BDP the residents' LR activities have been negatively affected. Residents recommended the construction of alternative LR infrastructure to help address the challenges facing them in the area.**

Keywords: **Water-base, Recreation, Dam, Bui Dam Project.**

I. INTRODUCTION

There are varying recreational activities pursued by recreationist throughout the world (Crawford et al., 2002). One of such recreational activities which has attracted a lot of participation is water-base recreational activity (County et al., 2004). According to Gyale (2007), water-base recreation refers to any recreational activity that is pursued in water or in relation to water resources. Similarly, Oram (1999) as cited in Fowler (2012) consider water base recreation as involving leisure activities that is focused on or pursued in marine environments. Marine environment according to Fowler (2012) does not necessarily refer to oceanic enclaves alone but also enclaves of other water resources. Water base recreational activities enjoy several economic and other non-economic benefits which drives the development of nations across the globe (Young, 2010; Ahiawodzi, 2013). Undoubtedly, water base recreational activities are seen as a therapy, because as a natural resource, water has a lot of medicinal and healing qualities that explains why it is still being used by residents of the world for leisure activities (Petraccia et al., 2006). Thus for a recreationist to be able to pursue water base recreation, water is a major requirement (Bixler & Morris, 2000). In simple terms, water base recreation cannot be effected by recreationist without water bodies and water basins like rivers, lakes/dams and oceans. According to Etiosa (2005) as cited in Ampadu et al (2015), river basins continues to serve as the venue for the advancement of human social progress and cultural heritages for societies as it serves as a location for the pursuit of water base recreation. During visits to water enclaves, local and international recreationist pursue activities like recreational fishing, swimming, canoeing, boating, skiing, scuba diving amongst others due to the satisfaction derive and the benefits inherent (Bowker, 2001; Huskyes et al, 2006; Fowler, 2012). Despite the enormous benefits provided by dams in relation to the pursuit of recreational activities, the construction process of the former leads to the displacement of thousands of lives, destroys cultures, affects economies, harms wildlife and vegetation and eventually truncate the benefits that could be derived by water base recreational activities (Richter et al, 2010; Donna, 2007; ICOLD, 2007; Tsikata, 2006; World Bank, 1995). The 400MW Bui dam project in Ghana which led to the displacement of over 1,216 residents downstream the Black Volta River (Hensengerth, 2011) is one of such projects in the world that the study sought to find out how its construction has affected residents water base recreational pursuits within the project enclave amidst the benefits derived by local recreationist. The study therefore focused on finding out residents' trend of visitations, activities performed at the river side before and after the dam to ascertain the changes that have ensued in resident's time budgets for activities pursued in the Bui project area due to the construction of the dam. Secondly the study sought to identify the effects of the dam construction on the Black Volta River and how it has affected the pursuit of water base recreational activities amongst residents in the Bui villages and Jama. The study further sought to find and recommend measures for increased participation in water based recreational activities amongst residents within these communities. Finally to examine the relationship that exist between residents' recreational pursuits and their socio-demographic and economic variables like age, gender, education and income status.

II. METHODOLOGY OF THE STUDY

2.1 Study Area

Two main communities, Jama and Bui resettled villages were used for this study. Both communities lie in the downstream section of the Black Volta River but located in two separate administrative districts and regions respectively. The Bui resettled villages is located in the Banda district of BrongAhafo Region whereas Jama is in the Bole district of the Northern Region. The Black Volta River serves as a boundary between the two study districts and regions as well.

The area is characterised by seasonal annual rainfall with bio-modal maximum recorded at the Banda district and a single maximum in the Bole district (BDA, 2013). The study communities are made of farmers, hunters, fisher folks from multi ethnic and religious backgrounds. According to Benneh and Dickson (1970) the temperature in the Banda district is largely high be in the region of about 24.5ºC (779 º F) throughout the year. The Banda district lands are fairly low lying and with most of the soils be sandy but loamy soils found in the valleys in the Bole district. Both districts are drained by the Black Volta and other smaller rivers and dug out wells.

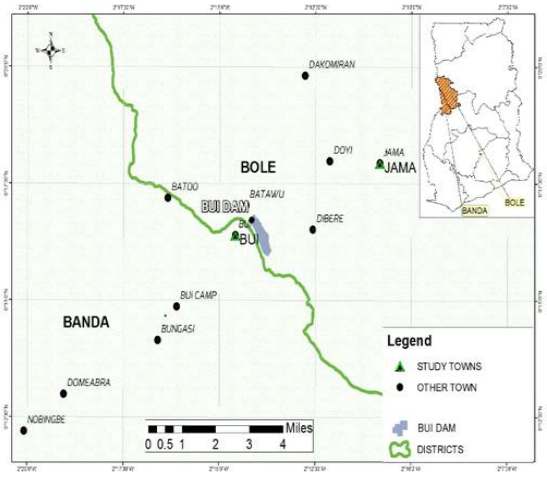

Figure 1: Map showing the two study districts (Banda & Bole districts) and the study villages (Bui villages & Jama)

Source: Field study (2015).

2.2 Study Design and Philosophy

Quality research strives on the choice of a suitable methodology that fits the purpose (Weber, 2004). This study adopted mixed philosophies and approaches in the collection and analysis of data. The triangulation approach was used for the entire study due to the fact that no single technique or design for collecting data is able to give accurate answers, solve, delineate, or validate a particular problem (Creswell, 2012; Teye, 2012; Tashakkori and Teddlie, 2010; Castro et al, 2010). The study employed the multistage sampling procedure for the selection of the study areas and the respondents respectively. Statistical tools and procedures such as the *SPSS version 16.0 and MS Excel* software were used to analyse and generate tables and 3D bar charts for the collected data.

2.3 Study Findings

The study findings are discussed under this section beginning with the socio-demographic characteristics of respondents. The next section focus on the trend of visitation and activities performed by respondents at the riverside **(Black Volta River)** before and after the project. This affords the researcher understanding of the changes that have occurred. The foregoing section focus on the specific damages suffered by the Black Volta River and the solutions to the many problems unravelled by the study. Finally, the last section is devoted to the conclusion, recommendations and proposition for future research.

2.3.1 Demographic Characteristics of Study Respondents

2.3.2 Age and Gender Distribution of Respondents

The study had a total of 200 respondents interviewed from the study area and it revealed a female dominance of 111 (56%) over male minority of 89 (44%). Out of the 200 respondents, (79.5%) were between the age bracket of 18-45 years while (19.5%) above 46 years.

2.3.3 Education and Occupational Distribution of respondents

The studyshows that vast majority 173 (86.5%) of respondents in Bui and Jama had acquired basic or Islamic educational backgrounds.Respondents have varying occupational backgrounds ranging from 74 (37%) farmers, 36 (18%) traders, 21 (10.5%) minority fisher folks and 69 (34.5%) involved in tertiary occupations. Regardless of the formal educational backgrounds of majority respondents it is obvious that most residents are involved in primary activities (occupation) for a livelihood.

2.3.4 Income Status and Respondents Length of Stay in the Study Area

The study revealed that majority 111 (56%) of respondents earn between GH₵ 0-50.00, 24% earn between GH₵ 51–100 whilst only 14.5% minority earning above GH₵ 201.00. The study further revealed that 58% of total respondents from both Bui and Jama have stayed in the study area for more than five (5) years whereas 41% of have stayed in the area for exactly five years or less. It further showed that majority of respondents have stayed in the study area before, during and after the BDP and were therefore privy to the impacts that the dam project have had on their LR pursuits.

2.3.5 Visitation And Activities Performed At The River Side Before The Bui Dam Project (BDP).

The Black Volta River which serves as a boundary between the Bui villages and Jama was a major recreational destination for residents in the catchment area. According to 75.5% of respondents interviewed from both communities they visited the river side on regular basis before the Bui dam project whereas 24.5 % were not regular visitors to the river side. It was revealed that 60 (30%) of the respondents pursued recreational fishing, 55 (27.5%) swimming, sightseeing anytime they visited the river side. Nonetheless non-recreational activities like fetching water for daily chores constituted 24 (12%) whereas buying fish and washing clothes by the river side were also significant. Cumulatively over 50% of residents have been negatively affected in the pursuit of water base recreational activities. See figure 2

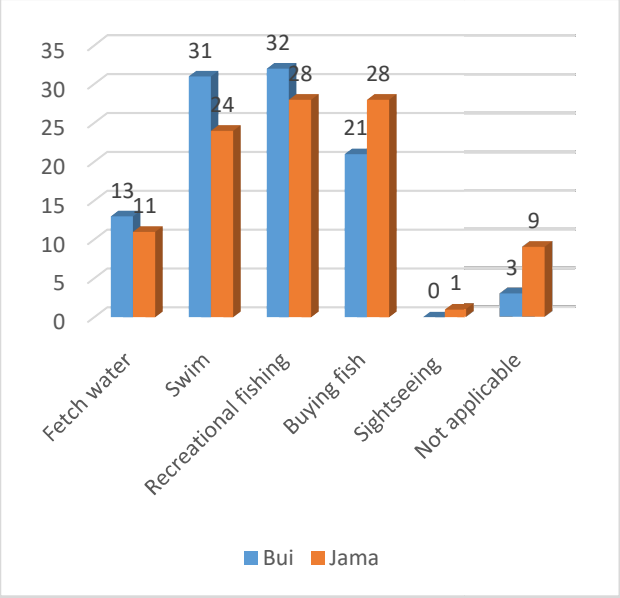

Figure 2: Activities Performed by Respondents at River Side before Project

Source: Field study (2015)

2.3.6 Perceived Benefits Respondents Visitations To Riverside

Just like (the California State Parks Planning Division, 2005; Kraus, 1966) stated in the past, respondents in the study area believe that the pursuit of LR activities at the BNP and the river side before the project was of great benefit to them in diverse ways. According to 31.5% of respondents, trips to the Riverside and the activities performed reduces sickness and makes them healthy whereas 21.5% believe that LR creates a bond of friendship between participants'. According to 12% of respondents, LR activities helped to unite their families and communities. About 6.5% of respondents also indicated that through site visitations, the consciousness for environmental protection of their environment is heightened. The views of the respondents confirm the notion of the Thorndike's (1932, 1935) Social Exchange Theory (SET) that in so far as residents of communities stand to benefit from certain resources, they would protect it at all times.

Table 1: Benefits of Site Visitations to Respondents

Exact Benefits	Bui	Jama	Total
Family unity	39	15	24 (12%)
Reduces sickness	31	32	63 (31.5%)
Make friends	27	16	43 (21.5)
Protection of environment.	6	7	13 (6.5%)
Provision of livelihood	1	6	7 (3.5%)
Others	2	1	3 (1.5%)
Non applicable	24	23	47 (23.5%)
TOTAL	100	100	200 (100%)

Source: Field study (2015).

2.3.7 Visitation and Activities Performed At the River Side after The Bui Dam Project (BDP)

Comparatively, the figures recorded for visitation to the riverside have changed after the completion of the BDP. After the completion of the project, visitation trends to the river side has reduced from 75.5% to 67% frequent visitation. Even though there has been a reduction in the frequency of visitation to the riverside, figure 3 shows that respondents continue to perform a range of activities during their visits to the river side after the project**.** However, whiles the performance of recreational fishing activities have increased from 60 (30%) to 64 (32%), swimming activities have declined from 55 (27.5%) to 45 (22.5%). Nevertheless, sightseeing activities have experienced an increase from zero to 2%. Non LR activities like buying fish from the river bank have also reduced from 14 (7%).Similarly fetching water from the river bank has drastically reduced from 24 (12%) to 5 (2.5%) after the BDP. The reduced visitation of residents cannot be attributed to payment of charges since majority of respondents (95%) confirmed non-payment of fees by local residents when visiting the riverside. It is clear that the implementation of the project had negatively impacted on the visitation and use of the river for LR pursuits and other equally important purposes.

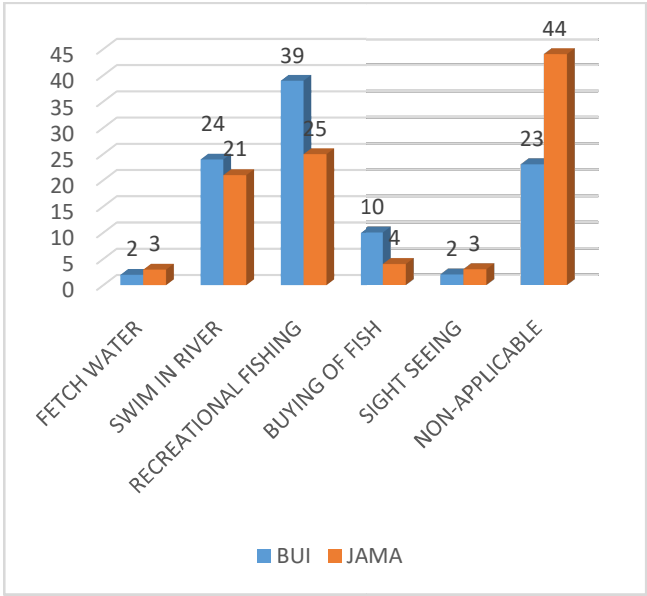

Figure 3: Activities Performed by Respondents at River Side after Project

Source: Field study (2015)

2.3.8 Reasons for Reduced Visitation to Riverside after the Project

Similar studies conducted elsewhere on dam's impacts by (Tsikata 2006; Donna, 2007; WB, 1993; Adams, 1985) revealed that dam projects have negative effects on the vegetation, wildlife as well as the culture of the people despite the benefits it presents as well. Similarly 50.5% of respondents in this study believe that the project has polluted

their water specifically the Black Volta. According to residents currently the river smells bad and that the odour does not make it safe and pleasant for them to swim in let alone fetch water for household consumption and chores. In the same way, 1.5% of respondents argued that due to the BDP, they are faced with series of restrictions from both BPA and BNPA officials.

A fisher folk lamented saying: 'the water has been polluted because of the dam, it now smells very bad and warm than original and we are afraid to swim in the river post the dam construction. Previously our children and even the elderly in our village use to swim in the river during the day when temperatures were very high and it made us refresh again, but now we have lost it because of this dam'

Similar revelations were confirmed in an FGD organized during the study. According to members; ***'there are no more fish in the river like previous and I believe this is due to the warm nature and disruption of flow of the water and so we(residents) hardly fish in the river****'.*

Another member in the group had this to say; ***'the dam is too huge, dark and dangerous for us to fish in it because we are not used to lake fishing but river fishing.This makes us afraid to even use canoe on the lake to fish'****.*

A group member also added that; ***'the dam is usually trapped and opened only in the evenings around 6:00pm every day and it flows at a very fast speed which time we are unable to fish nor swim for fear of our lives. Sometimes when the dam is opened, most of our fishing nets and canoe are destroyed, so imagine how can we swim or fish in such situation'.***

In an interview with the assemblyman for Bui villages, he confirmed the accessions made by respondents and also recounted that; ***'during the day, the water flowing downstream is blocked by BPA and this*** **exposes the bed rocks in the river with no water running through the channel and this makes people who are willing to swim unable to do so because it is not safe'**. ***See figure 2 and three***

The revelations from this study confirms Tsikata (2006) findings that most residents living near dam construction sites live in the 'Shadows of Large Dams' as they are sometimes deprived of their basic needs and recreational sites.

Picture 1: Expose Bed of the Black Volta River during Day Time (picture taken at 12:20pm

Source: Field Study, (2015).

Picture 2: Release of the Bui Dam in the Evening (picture taken at 6:30pm)

Source: Field Study, (2015).

2.3.9 Current Recreational Activities Pursued By Respondents

Sightseeing, recreational fishing, swimming and canoeing which hitherto were some of the main water-based recreational activities of the people have now changed due to numerous environmental damages on the Black Volta by the project. The negative impacts have forced residents to find other alternative recreational activities. For instance 37% of respondents now prefer watching TV shows and programmes like football matches, Local Ghanaian movies, and Telenovelas amongst others which are largely indoor recreational activities though alien. Again 8.5% of respondents prefer chatting with family members in their homes whiles 6% prefer VFR during their leisure periods than performing their previous traditional recreational activities. However 5.5% of respondents continue to play football even after the completion of the project.

2.3.10 Testing Hypotheses

The study conducted a comparative analysis to have an insight into residents' socio-demographic and economic variables like gender, age, educational status, income levels and community attachment and their relationship with leisure and recreational pursuit using the 'chi-square' statistical test. The decision rule was that, differences in results become significant if the 'p' value of the computed result is less than 0.05 and insignificant if the 'p' value is greater than 0.05.

2.3.10.1 The Null Hypotheses (Ho): tested was that, there is no relationship between LR and socio-demographic or economic variables like gender, age, education, income and community attachment.

2.3.10.2 The Alternative Hypotheses (Ha): was that, there is a significant relationship between LR and socio-demographic and economic variables like gender, age, education, income, community attachment.

2.3.11 Gender and Recreational Activities

The chi-square analysis from table 3established a significant association between gender and recreational activities with a 'p' value of *0.02* but no association between gender and recreational locationsince the p-value was *0.567.* This means that the decision to play football, watch TV, swim or go for recreational fishing could be influenced by the gender of the participant butwherever one spends his/her leisure that is either at home, immediate neighbourhood or distant locations is not because the person is a male or female.

Table 2: Relationship between Gender and Recreational Activities

RECREATIONAL ACTIVITY	MALE	FEMALE	TOTAL
WATCHING TELEVISION	23	24	47(23.5%)
SWIMMING	2	1	3 (1.5%)
PLAY FOOTBALL	10	1	11 (5.5%)
CHATTING	9	8	17 (8.5%)
VFR	9	5	14 (7%)
OTHERS	34	72	106 (53%)
TOTAL	100	100	200 (100%)
	Chi square value of 0.02		

Source: Field Study (2015)

2.3.12 Income and Recreational Activities

The chi-square analysis of 'p' value of 0.831 showed no association between income and recreational activities pursued by respondents. However, the analysis established a significant relationship between respondents' level of income and their recreational location with a 'p' value of 0.019. It therefore means that the income status of an individual does not influence the kind of recreational activity that may be performed by the person but where he/she spends his/her leisure time and perform a recreational activity (location) is influenced by the person's level of income.

2.3.12 Relationship between Educational Level and Recreational Activities

The study established that education has a greater influence on the recreational activity one performs during leisure period with a p-value of 0.020. Thus the decision to either play football or watch a television programme is driven by one's level of education. Similarly, the analysis of 0.036 shows a significant relationship between respondents' level of education and where one pursues LR. For instance, the analysis showed that respondents with basic and secondary educational background watch TV more than those with tertiary educational background. Meanwhile basic school graduates like playing football more than secondary and tertiary graduates. This is so because, people select their recreational activities based on their level of understanding of its benefits or excitement.

Table 3: Age and Recreational Pursuits

ACTIVITY	18-25	26 -35	36-45	46ABOVE
WATCHING TV	21	12	4	10
SWIMMING	1	0	2	0
PLAY FOOTBALL	7	2	2	0
CHATTING	5	4	3	5
VFR	4	3	1	6
OTHERS	65	60	20	38
CHI SQUARE VALUE OF .168 (RECREATIONAL ACTIVITY) CHI-SQUARE VALUE OF 0.023 (LEISURE LOCATION)				

Source: Field Study

Meanwhile, the study could not establish any relationship between lengths of stay (community attachment) and respondents' recreational activity as the chi-square value of 0.624 obtained was greater than 0.05. This simply means that the number of years one have lived in a community do not influence one's recreational decisions.

2.3.13 Relationship Between Respondents' Age And Recreational Activities.

The outcome of the analyses revealed a significant association of 0.023 p-value exists between age and leisure locations. However the relationship between recreational activity and age was negative as the result obtained was p-value of .168. Thus even though the age of an individual will influence whether to have a home based, neighbourhood based or travel to a distant location for leisure, the same cannot be said of the kind of recreational activity he/she may pursue. For instance, the young and the old will all like to watch football but perhaps, the young may prefer to be at the stadium whereas the old may like to do so on TV at home.

III. SUMMARY, CONCLUSION AND RECOMMENDATION

The construction of large dams has led to the displacement of thousands of lives, destroyed cultures, affected economies in the area of climate change, wildlife, vegetation, food production and also leisure and recreation of local residents the world over. The study can confirm that prior to the BDP, the Black Volta River was a major place of visit by both local residents and international LR participants. Prior to the BDP recreational fishing, swimming, sight-seeing, canoeing were the major water base recreational activities that were pursued at the Black Volta.

The study can further sanction that visitation to the riverside by residents and non-residents have dropped significantly after the completion of the BDP. The main problem attributed to the dropped in water base recreational pursuit by local residents was the pollution of the Black Volta River, disruption of river flow and the increase in the water level in the river, poor water quality or change in water chemistry (bad odour) amongst others.

Again, the study established that, socio-demographic and economic variables like gender, age, educational status, income, community attachment (length of stay) do have varying associations with residents' LR pursuits and therefore accepts Pitkänen and Adamiak (2013) assertions in some instances. The study can affirm that over 51% of residents are dissatisfied with the conditions of recreational facilities available whereas over 48% of respondents are satisfied with the recreational facilities available. Finally, 97% of respondents agreed that LR needs to be facilitated to help foster community solidarity in the BDP area. The study can settle that about 99.5% of respondents are ready to welcome investments into the LR sector within their communities. To resolve the challenges in the area, the study wish to recommend the following for consideration by stakeholders;

First and foremost, government through the district assembly of Banda and Bole must create good recreational environment for residents in the catchment area through the provision of modern community centres and children play grounds equipped with facilities as part of their annual action plans (AAP).

The Bui Power Authority would have to review its water release plan to favour local residents downstream to rekindle the recreational fishing activities of residents in the area. Again, the BPA should consider the reconstruction of water base recreational hub to attract international tourist and local LR participants.

REFERENCES

[1]. **Adams, W. M. (1985).** The Downstream Impacts of Dam Construction: A Case Study from Nigeria. *Transactions of the Institute of British Geographers, 10*(3), 292-302.

[2]. **Ampadu, B., Akurugu, B. A., Zango, M. S., Abanyie, S. K., &Ampofo, S. (2015).** Assessing the Impact of a Dam on the Livelihood of Surrounding Communities: A Case Study of Vea Dam in the Upper East Region of Ghana.

[3]. **Asiedu A.B. (2014).** Not Just Visiting-Towards Leveraging Tourism for Enhanced National Development in Ghana (Inaugural Lecture). University of Ghana, Accra.

[4]. **Banda District Assembly (2013).** Development Planning Co-ordinating Unit, Annual Report.

[5]. **Bixler, R. D., & Morris, B. (2000).** Factors differentiating water-based wildland recreationists from nonparticipants: Implications for recreation activity instruction. *Journal of Park & Recreation Administration*, *18*(2).

[6]. **Bowker, J. M. (2001).** Outdoor recreation by Alaskans: projections for 2000 through 2020.

[7]. **Klassen, A. C., Creswell, J., Clark, V. L. P., Smith, K. C., & Meissner, H. I. (2012).** Best practices in mixed methods for quality of life research. *Quality of Life Research*, *21*(3), 377-380.

[8]. **California State Parks Planning Division (2005).** The Health and Social Benefits of Recreation, State of California Resources Agency.

[9]. **Castro, F.G., Kellison, J.G., Boyd, S.J., and Kopak, A. (2010).** "A Methodology for Conducting Integrative Mixed Methods Research and Data Analyses" *Journal of Mixed Methods Research. 4*(4):342–60.

[10]. **County, M., Riverkeepers, W., & Willamette Restoration Initiative. (2004).** Marion County: Willamette River water trail implementation plan.

[11]. **Crawford, D. W., Houts, R. M., Huston, T. L., & George, L. J. (2002).** Compatibility, leisure, and satisfaction in marital relationships. *Journal of Marriage and Family*, *64*(2), 433-449.

[12]. **Denman, R. (2001).**Guidelines for community-based ecotourism development. WWF International.

[13]. **Dickson K. B and Benneh G. (1970).** A New Geography of Ghana, Longman Group Ltd.

[14]. **Donna Shepard (2007).** Measuring the Visitor Experience at the Wechiau Community Hippo Sanctuary:

[15]. **Dumazedier J. (1960).** Current Problems of the Sociology of Leisure. *International Social Science Journal, 4*(4), 522-531.

[16]. **EdgellSr, D. L., and Harbaugh, L. (1993).** Tourism development: An economic stimulus in the heart of America. *Business America*, *114*(2), 17-18.

[17]. **Fowler, P. (2012).** *Critical issues affecting the service quality in water-based tour operator: a case study of marine leisure tourist guide in Andaman Cluster, Thailand* (Doctoral dissertation, Prince of Songkla University).

[18]. **Ghana Tourist Board (2010).** Tourism Statistical Fact Sheet on Ghana: Ghana Tourist Board, Research Department.

[19]. **Grant Cushman, G., and Allan Laidler, A. (1990).** Recreation, Leisure and Social Policy. (4), Canterbury, NZ, Department of Parks, Recreation and Tourism. Lincoln University, 2.

[20]. **Hensengerth, O. (2011).** Interaction of Chinese institutions with host governments in dam construction: the Bui Dam in Ghana.

[21]. **Huskyes, E., & O'Connor, K. (2006).** Water-based Tourism and Leisure Product Audit 2006

[22]. **International Commission on Large Dams (2007).** The World Register of Dams. ICOLD, Paris. Available at http://www.icold-cigb.net

[23]. **Jennings, G. (2007).** Water-based tourism, sport, leisure, and recreation experiences. In *Water-based tourism, sport, leisure, and recreation experiences* (pp. 19-38). Routledge.

[24]. **Moxon, J. (1984).** Volta. *Man's Greatest Lake: The Story of Ghana s Akosombo Dam, Andre Deutsch, London*.

[25]. **Petraccia, L., Liberati, G., Masciullo, S. G., Grassi, M., &Fraioli, A. (2006).** Water, mineral waters and health. *Clinical nutrition*, *25*(3), 377-385.

[26]. **Pitkänen, K., Adamiak, C., and Halseth, G. (2014).** Leisure activities and rural community change: Valuation and use of rural space among permanent residents and second home owners. *SociologiaRuralis*, *54*(2), 143-166.

[27]. **Richard Kraus (1966).** Recreation Today: Program Planning and Leadership. Englewood Cliffs, NJ, Prentice-Hall, p. 7

[28]. **Richter BD, Postel S, Revenga C, Scudder T, Lehner B, Churchill A, Chow M (2010).** Lost in development's shawdow: The down-stream human consequences of dams. *Water Alternatives* 3:14-42

[29]. **Teddlie, C., &Tashakkori, A. (2010).** Overview of contemporary issues in mixed methods research. *Handbook of mixed methods in social and behavioral research*, 1-41.

[30]. **Teye, J.K (2012).** Benefits, Challenges and Dynamism of Positionalities Associated with Mixed Methods Research in Developing Countries: Evidence from Ghana. International Journal of Mixed Methods Research. Vol 6, No (4), 379-391

[31]. **Tortajada C. (2000).** Environmental Impact Assessment of Water Projects, Water Resources Development, *Vol. 16, No. (*1), pp. 73-78.

[32]. **Tsikata D. (2006). Living in the shadow of large dams: Long term responses of down-stream and lakeside communities of Ghana Volta river project. Brill Academic Publishers, Leiden**

[33]. **Walker, P. (1999).** Promoting inclusion in recreation and leisure activities: an information package. *Report on Community Inclusion, Center on Human Policy. Syracuse University, New York*.

[34]. **World Bank, (1995).** Mainstreaming the Environment: The World Bank Group and the Environment since the Rio Earth Summit, the World Bank, Washington, D.C

[35]. **Yamane, T. (1967)**. *Problems to Accompany Statistics: An Introduction Analysis*. Harper & Row.

[36]. **Young, R. A. (2010).** *Determining the economic value of water: concepts and methods*. Routledge.