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THE EFFECTS OF DAM CONSTRUCTION ON RESIDENTS RECREATIONAL PURSUITS-A CASE STUDY OF THE BUI DAM PROJECT GHANA

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ABSTRACT

Dams are of great benefit to mankind in diverse ways through the provision of water for both domestic and industrial use, source of hydro-power, flood control and for recreational purposes. Unfortunately, the construction of dams also leads to the displacement of thousands of lives, destroys vegetation, disturb wildlife, affect food production, destroys cultures among several others. This study focuses on assessing how the construction of the Bui dam project impacted on the recreational pursuits of residents within the Bui National Park catchment area.

To achieve this, a total of 200 respondents were interviewed using structured questionnaires, interview guides and Focus Group Discussions. Expert interviews were also conducted to gather views of the experts on the effects and possible solutions to the damages identified. The study found out that the Bui Dam Project (BDP) has changed the time budgets of residents in the area following its completion. Similarly, it was revealed that recreational activities like fruit picking, hunting, sight-seeing in the forest reserve amongst residents and non-residents which hitherto was very common and widespread has been affected due to the

460

flooding of over 50% of the Bui National Park (BNP). Whiles over 50% of the BNP got flooded, several wildlife in the reserve could/cannot be traced anymore. Local residents argue that their source of joy has been taken from them by project construction and called for recreational parks and provision of infrastructure to help address the challenges facing their leisure and recreational development and participation in the catchment area.

461

Keywords: Forest resources, Recreation, Large dams, Bui Dam Project (BDP), Bui National Park (BNP), Bui National Park Authority (BNPA)

INTRODUCTION

The pursuit of recreational activities like hiking, fruit picking, recreational hunting, birds watching, sightseeing, playing football which are mostly pursued within parks and forest reserves have been observed to promote healthy living, preserve cultures, protect forest and wildlife and presents to residents varying economic benefits (Rajović et al, 2013; Asiedu, 2002; Denman, 2001; Edgell, 1993).

Similarly, dams are of equal importance to residents as it provides hydro-electricity, means of transport, promotes flood control, water for both domestic and industrial use and also presents avenue for the pursuit of water-base recreational activities and other significant roles in economic growth in countries (ICOLD, 2007; Bowker, 2001; Huskyes et al, 2006).

Richter et al, 2010; Donna, 2007; ICOLD, 2007; Tsikata, 2006; WCD, 2000; World Bank, 1995 as cited in Baffoe and Asiedu (2019) argue that despite the seeming benefits provided by dams, the construction of dams turns to impede the benefits that could be accrued from the pursuit of the forest-based recreation due to the submergence of forest resources and flora and funa, displacement of lives, destruction of traditional cultures, disturbs economies, destructs wildlife that otherwise could have provided resources for pursuing recreation.

In addition, according to Donna (2007) parts of family histories and sometimes favourite places of relaxation are lost and this obstructs the pursuit of fruit picking, hunting, sightseeing, insects and bird watching, hiking and even playing football in such destinations.

Prior to the Bui dam project, the Bui National Park (BNP) which was sited close to the river served as a recreational destination for both local and international recreational participants. The question then comes up, if leisure and recreation are important and the BNP served as a destination for LR participants, have we cared to find out what has happened to the BNP with respect to recreational activities like fruit picking, recreational hunting, hiking, sightseeing, bird watching and others? Certainly not, despite all the numerous studies (Sedegah et al., 2019; Baffoe & Asiedu, 2019; Yankson et al., 2018; Kirchherr et al., 2016; Obour et al., 2016; Atindana et al., 2015) etc. that have been conducted within the Bui dam catchment area by individuals and institutions, no effort has been made to investigate and find out how the project have affected the forest resources and forest-base leisure and recreational pursuits of residents within the project

area. It is against this background that, this study sought to find out the impacts of the Bui Dam project on the leisure and recreational pursuits of residents living in the resettled and non-resettled communities in the project area.

462

The main focus of the study was to find out the damages caused by the project to the forest reserve and the extent to which such damages have affected the traditional LR pursuits of the residents in the catchment area and eventually to propose some solutions to some of the damages identified.

METHODOLOGY OF THE STUDY

Study Area

The study was conducted in two communities, Bui resettled villages in the Banda district of Brong Ahafo Region and Jama a village in the Bole district of the Northern Region. The Bui dam project which is located on the black volta river serves as a boundary between the two study towns and districts. The area is characterised by seasonal annual rainfal with bio-modal maxium recorded at the Banda district and a single maximum in the Bole district (BDA, 2013). The study communities is made of farmers, hunters, fisherfolks from multi ethnic and religious backgrounds. The temperature in the Banda district is generally high averaging about 24.5°C throughout the year (Benneh and Dickson, 1970). The land in the Banda district is generally low lying and most of the soils are sandy and in the valleys loamy soils exist with the Bole district having predominantly light textured surface horizons in which sandy loams are common. Both districts are drained by the Black Volta and other smaller rivers and dug out wells.

Background of the Bui National Park (BNP)

Bui National Park was gazetted in 1971 by legislative instrument (LI 710) of the Wildlife Reserves Regulations of Ghana. The park was created from two existing reserves created in the colonial era (about 1948): the Banda Watershed forest reserve in the Brong-Ahafo Region and the Lanka forest reserve in the Northern Region. It was extended northwards along the Black Volta River to the Ghana – Côte d'Ivoire boundary where the river turns eastwards to enter Ghana. This was to protect the whole drainage basin of the Black Volta River inside Ghana. The primary purposes of establishing Bui National Park were:

- Biodiversity conservation
- Protection of the proposed Bui Dam catchments area from human settlements and activities.
- Prevention of siltation due to soil erosion induced by shifting cultivation practices.
- Promotion of the attractive scenery and wildlife in the part for ecotourism.

The Bui National Park and its catchment area lie in the north-western corner of the Brong-Ahafo Region of Ghana and extend into the south-western portion of the Northern Region of Ghana. It covers an area of about 1,812 km and it is bisected into two almost equal halves by the Black Volta River which takes its source from Burkina Faso (the river also serves as the boundary between the Brong-Ahafo Region and the Northern Regions of Ghana). The Ghana-Côte d'Ivoire International Boundary forms the western boundary

of the park. It is bordered to the South by a long stretch of hills called the Banda Hills, through which the Black Volta River passes at a gorge. Bui lies in the transitional vegetation zone of Ghana, where forest gradually "melts" into wooded Guinea Savannah. Bui National Park presents a peculiar vegetation type: there is a stretch of riverine forest found along both sides of the Black Volta River, where forest tree species are found. Further away from the river are many short wooded tree species interspersed with tall grasses. There are at least 122 plant species. There is a reasonable variety of some fauna species: 13 reptile and 3 amphibian species found, 226 bird species, 40 species of large mammals belonging to 13 families, low levels of small mammals and high levels of insect species diversity. Bui National Park is home to the largest Hippopotamus population in Ghana, about 300 in number. They are found along the length of the river inside the reserve, concentrated at specific areas where the current is not swift, designated as Hippo pools. Hippopotamus is endangered and so are black and white colobus, lions and elephants that are also present in the park. There are indigenous tribes fringing the park. The three major groups are: the Gonjas at the northern border of the park, the Mos at the Eastern border and the Bandas at the Southern frontier. There are however some settlers among the communities. Small communities of Ivorian tribes can be found on the Western side of the park. There are about 45 communities (villages) around the park. All these communities depend on the natural resources around the park for livelihood e.g. farming, hunting, fishing, charcoal burning etc. This sometimes results in conflicts with park staff and management and the local residents.

463



Figure 1: Map showing the Bui National Park and the dam

According to Weber (2004) quality research findings rest on the selection of a methodology that fits their purpose. To establish facts from varying experiences, positivism and anti-positivism philosophies or approaches were used in the collection and analysis of data. This led to the adoption of the mixed-method or triangulation research design. The triangulation approach was used for the entire study due to the fact that no single technique or design for collecting data can give accurate answers, solve, delineate, or validate a particular problem (Tashakkori and Teddlie, 2010; Castro et al, 2010; Teye, 2012). Both primary and secondary data were used for the study.

Sampling Technique

A multistage sampling procedure was used for the selection of the study areas Banda and Bole districts respectively and also for the respondents' selection. First and foremost, the lottery approach of simple random sampling was used in the selection of Jama and Bui resettlement cluster. The systematic random sampling was then adopted in the selection of the housing units. In the process, the enumeration areas were divided into quadrants and every fourth (4th) house selected from where the respondents for the interview were finally selected randomly from the housing units. Finally the purposive sampling technique was employed in the selection of opinion leaders like the assembly man, chiefs, the BNPA officials and district administrative officials.

Sample size

Despite the sampling size formula giving 187 respondents, for effective comparative analysis of the two study communities, the figure was rounded up to 200 respondents thus; 100 each from the two study communities respectively. In all a total of 200 respondents were therefore sampled across the two study communities using Yamane's (1967) formula as shown below;

$$n = \frac{N}{1 + N(e)^2}$$

With a confidence level of 95% and a precision of '0.10', where 'n' represents sample size whereas 'N' represents total population of the community. Given the total population per the two communities, a sample size of 187 was initially realize but for accurate comparison of some information from the two communities a round figure 200 respondents were used.

Data Analysis Technique and Tools

The collected data was analysed using statistical tools and procedures such as the *SPSS and MS Excel* software. *Chi-square* analysis was also conducted using the SPSS to test certain variables like age, occupation, education, and its relations with recreational choice.

The discussion commence with the characteristics of study respondents. This offers the socio-demographic, economic and cultural traits of residents in the catchment area. The next section focus on the trend of visitation and activities performed by respondents at the BNP before and after the project. This gives a clearer picture of the changes that have occurred in view of the project. The last but one section emphasises on the specific damages suffered by the BNP and the many problems identified by the study. The final segment is ardent to the conclusion, recommendations and propose future research.

DEMOGRAPHIC CHARACTERISTICS OF STUDY RESPONDENTS

Age, Gender & Educational Distribution of Respondents

In all there were more females (56%) than males (44%). The study revealed a very youthful population in the two communities with two-thirds majority (79.5%) of these respondents been between the ages 18-45 years. From the two communities, the data revealed that a total of (86.5%) respondents from the two study communities had at least basic educational backgrounds.

State of Visitation to the Bui National Park (BNP) and Activities Performed Prior to the Bui Dam Project (BDP)

The study revealed that prior to the project, the BNP was a regular place of visit by residents. As shown in *table 1*, a whopping 89 (44.5%) of respondents regularly visited the BNP before the dam was constructed. Although it wasn't majority of respondents that visited the forest regularly, almost 45% was indeed significant and that the study can confirm that the Bui forest reserve which hosted the BNP was relevant to the people in the area. The argument that rises was, what was the purpose of their visits to the forest?

According to residents, the BNP was their home, a place that hosted some communities that were affected by the construction of the dam reservoir. Besides, residents mentioned that their community football park and so they spent more time to carry out series of their recreational activities as shown in **table 1** that playing football 38(19%). Some 28(14%) respondents argued that the forest reserve hosted mangoes, shear nuts, kola and other wild fruits and so they went there to do fruit picking. Similarly, due to the beautiful flora and fauna found in the park, lively birds and other wildlife 7 (3.5%) aligned their visitation to sightseeing. Although a forest reserve, 9 (4.5%) attributed their visitation to recreational hunting with the justification of using less harmful weapons. Some of these facts can be confirmed from the background history of the Bui National Park as narrated.

Frequency of visit	Bui	Jama	Total	
Very Often	25	21	46 (23%)	
Often	14	8	22 (11%)	
				Table
Somehow Often	13	8	21 (10.5%)	Lanc
				1:
Not At All	48	63	111 (55.5%)	Visito
TOTAL	100	100	200 (100%)	visita
				tion to

the BNP before the Bui dam project

Source: Field study (2016).

Table 2: Activities that were performed by recreationist during visit to BNP before the project.

Activities	Bui	Jama	Total
Hunting	2	7	9 (4.5%)
Fruit picking	19	9	28 (14%)
Play football	24	14	38 (19%)
Sight seeing	5	2	7 (1.5%)
Fetch firewood	3	6	9 (1.5%)
No activity	47	42	89 (78%)
TOTAL	100	100	200 (100%)
Source: Field Study (2016).			

Undoubtedly, hunting was one of the oldest recreational activities which was pursued by the generations in the past due to the joy and other benefits they derived from it and so it is not surprising to hear that, people in this area pursued same even in the 21st century when legally the BNP is a reserved area.

CHANGES IN RESIDENTS' TIME BUDGET FOR RECREATIONAL ACTIVITIES RESULTING FROM THE BUI DAM Project (BDP)

Clearly, the BNP has been damaged by the dam construction per the results of the study. This has caused a dramatic change in the time budget of residents in terms of LR pursuit in the area. The responses takes note of residents past LR activities in the forest reserve and compare it to their current leisure and recreational activities to ascertain the exact changes that have occurred.

State of Visitation to the Bui National Park (BNP) and Activities Performed after the Bui Dam Project (BDP)

The study exposed the fact that the construction of the BDP has affected residents' access to the park and for that matter the performance of their recreational activities as shown in *Table 3* that visiting trends of respondents to the BNP after the project has completely declined from 44.5% regular to 22%. On the other hand there has been an increased in the non-visitation rate from 55.5% to 78%. Meanwhile **table 3** shows a

corresponding change in the activities performed at the BNP as the frequency of respondents visit has declined. For instance, fruit picking activities have now reduced from 28 (14%) to 13 (6.5%) whereas playing football has equally experience a downward trend from 38 (19%) to 22 (11%). Similarly, activities such as sightseeing has seen a downward trend from 7 (3.5%) to 3 (1.5%) and hunting from 9 (4.5%) to 3 (1.5%) in participation by residents in both towns after the project.

467

Table 3: Regularity of visit to the BNP After the project

Responses	Bui	Jama	Total
Very often	11	8	19 (9.5%)
Often	3	5	8 (4%)
Somehow often	9	8	17 (8.5%)
Not at all	77	79	156 (78%)
Total	100	100	200 (100%)

Source: Field study (2015)

Table 4: Activities Performed by Respondents at the BNP after the Project.

Activities	В	Bui	Jama	Total
Hunting		2	1	3 (1.5%)
Fruit picking		6	7	13 (6.5%)
Play football	1	13	9	22 (11%)
Sight seeing		1	2	3 (1.5%)
Fetch firewood		1	2	3 (1.5%)
No activity	7	77	79	156 (78%)
Total	1	00	100	200 (100%)

Source: Field Study, (2015)

Reasons for Reduced Visitation to Bui National Park (BNP) after the Project

The results of the study revealed in *figure 3* that 123 (61.5%) representing majority of respondents attribute the decline in visitation to the submergence or flooding of the BNP following the construction of the dam reservoir. Whiles respondents argue that over 50%, thus half of the forest is now under water, officials of BPA argue contrary with a claim that only over 30% got flooded but not up to 50%.

BPA official argued that, 'Per our checks and estimations, only about 30% of the park got flooded not 50% as claimed by local residents'. It is however true that some of the game and wildlife died during the flood and the surviving ones migrated to the peripheries of the park. Because of that, we had to suspended tourism activities in the park because as an eco-tourism park, the wildlife is very important. 'We are still searching for the few wildlife that survived the flood so we could reopen the park to both local and international tourist'

The flooding of the BNP by the construction of the dam reservoir has affected LR activities like fruit picking, recreational hunting, sightseeing and others. Another 18 (9%) argue that the long distance for which they have to walk before reaching the BNP considering their current geographical location as a result of the resettlement of those affected by the dam project has discouraged them from visiting the un-flooded portion of the park.

468

Equally residents complained about restrictions from the BNPA officials from visiting the park for their recreational activities.





In an interview with an official of the BNPA, he confirmed that the restrictions as claimed by local residents has been imposed because 'residents undertake illegal activities like lumbering and hunting in the forest when they are allowed entry into the forest reserve'.

Also 24% of respondents argued that the residents have lost their play grounds which hitherto lied within the BNP but was not replaced during the resettlement.

Meanwhile the project has resulted to population explosion and land scarcity of land within the catchment area which makes it impossible for resident to create their own parks for outdoor recreation. In an FGD some residents argued that, 'we cannot even create our own recreational centre for enjoyment because of land. In our resettled communities, if you need any land you would have to apply to the BPA in Accra and it will take several months and eventually we are denied and so we cannot visit the remaining park neither can we create our own, it's sad'

Another FGD participant lamented "we had a church building at our former community within the forest and it got flooded by the dam but this has not been replaced after our resettlement and for that reason, the only community centre we have, has been 'hijacked' by the churches making it difficult for us to recreate in the community centre during our leisure periods'. A resident in Jama said 'previously there were several mango trees in the forest reserve and so during the mango season we go there in groups to pick some fallen mangoes to enjoy and sometimes to sell some for money but now all those places have been flooded after the construction of the dam'

Another woman from Bui villages said *'it is not only mangoes that were found in the forest but there were also a lot of kola trees which bear fruits for us to pick'*.

The assemblyman of Bui villages also recounted this 'our previous place had a lot of beautiful flora and fauna and several fruit bearing trees which attracted both local and international recreational participants but after the dam project the whole area has gone under water living us no place to relax, this is quite worrying'

Another BNPA official told the research team that 'most of the monkeys especially the small ones that could not swim died during the flooding of the forest which has truncated activities of sightseeing in the park by residents and non- residents'

Current Recreational Activities of Respondents

Hunting, fruit picking, sightseeing and even playing football which hitherto were the main recreational activities of the people have now change due to numerous damages by the project to the forest reserve. Currently 37% of respondents now prefer watching TV shows and programmes like football matches, local Ghanaian movies, and telenovela amongst others which are largely indoor recreational activities and alien to local residents who preferred hunting or fruit picking which are outdoor activities. Residents are gradually losing their traditional LR activities for modernity because of the destruction of their traditional LR space. 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.

Table 5: Recreational Activities of Respondents

Activity	Bui	Jama	Total
Watching TV	34	40	74 (37%)
Swimming	2	1	3 (1.5%)
Playing football	6	5	11 (5.5%)
Chatting	10	7	17 (8.5%)
VFR	6	6	12 (6%)
Others	42	39	81 (40.5%)
Total	100	100	200(100%)

Source: Field Study, (2015).



Figure 5: Some Local Residents of Bui playing Ludu During their Leisure Time

Source: Field study (2015)

Challenges Facing Respondents Leisure and Recreational (LR) Pursuits After the Project

Table 9 shows that 111 (55.5%) believe the major problem facing their LR activities is the absence of recreational space in the area. Meanwhile to 73 (36.5%) of respondents, poverty is their major enemy to their LR pursuit. To 19 (9.5%) it is rather the harsh weather conditions they are currently experiencing as a result of the change in climate which is their main challenge to leisure pursuits. About 5 (2.5%) attribute non-participation to land scarcity. During the FGD, residents revealed that even if they wish to construct their own recreational facilities they needed to consult BPA for approval for land and they are mostly denied permit. However majority (43%) of respondents believe that with the provision of recreational facilities and job (42.5%) creation LR pursuits can be revived in the area.

However, residents are in a state of dilemma if their traditional LR activities can be revived. About 45% of respondents believe with the current challenges LR pursuits are not sustainable in their communities.

Table 6: Challenges Facing LR Pursuits in the community after the Bui Dam Project (BDP)

Challenge	Bui	Jama	Total
Poverty	32	41	73(36.5%)
Recreational Facilities	55	46	111(55.5%)
Harsh weather	11	8	19(9.5%)
Unemployment	2	-	2(1%)
Land scarcity	-	5	5(2.5%)
Total	100	100	200 (100%)

Source: Field Study, (2015).

GSJ: Volume 8, Issue 8, August 2020 ISSN 2320-9186 Table 7: Suggested Solutions to LR Challenges of Respondents

Suggestion	Bui	Jama	Total
Creation of jobs	40	45	85 (42.5%)
Recreational Facilities	48	38	86 (43)
Re-afforestation	9	9	18 (9%)
Release of land	-	1	1 (0.5%)
Total	100	100	200 (100%)

Source: Field Study, (2015).

SUMMARY, CONCLUSION AND RECOMMENDATION

The construction of large dams despite its relevance has led to the displacement of thousands of lives in Bui dam project area, destroyed their cultures, affected wildlife and eco-tourism, food production and also leisure and recreation of local residents (World Bank, 1995). The findings in Bui and Jama are not different from those elsewhere about the damages posed by the construction of large dams. This study can confirm that prior to the BDP, the BNP was a major place of visit by both local residents and international LR participants. The area was an eco-tourism zone which helped LR participants. It can also be confirmed that during such visits, local LR participants pursued activities like playing football, fruits picking, recreational hunting activities, sight-seeing in the BNP.

The study can further sanction that visitation to the BNP by residents and non-residents have dropped significantly after the completion of the BDP of which respondents attribute it to the flooding of the over 30% of the BNP area, the long distance from their current place of residences, the intermittent flow of the river. Over 78% of respondents in the study area affirmed that the BDP has resulted in change in the geographical location of their LR activities which hitherto was outdoor dominated.

The study can affirm again that over 51% of residents are dissatisfied with the conditions of recreational facilities available whereas over 48% of respondents are slightly 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 and therefore about 99.5% of respondents are ready to welcome investments into the LR sector within their communities. Undeniably, the Bui Dam Project (BDP) has not benefited residents especially forest-base recreation as it was anticipated and therefore can't agree more with Yankson et al. (2018) that the construction of the BDP has caused more harm than good to the residents in the catchment area. It is again a fact that, due to the damages caused BNP by BDP, the main purpose of creating the Bui Forest reserve in 1971, thus biodiversity conservation, promotion of the attractive scenery and wildlife in the part for ecotourism is under serious threat. The benefits that would have been gained by LR participants in the BNP is equally under danger.

To resolve the challenges in the area, the study wish to recommend the following for consideration by stakeholders;

First and foremost, the forestry commission together with the district assembly must make conscious efforts to give out free fruit bearing plant seedlings like mangoes, shea-nuts, cashew, cola amongst others for replanting in the left portions of the BNP. This will help restore the fruit picking activities amongst the local residents in the future and also economically equip the local residents.

Again, it is also important to recommend that the government should equip the BNPA to be able to protect the arguable remaining 70% of the forest from encroachers, illegal lumbering and hunters that might attack the existing wildlife species in the BNP. This will help to promote sightseeing for both local and international LR participants.

Furthermore, BPA and BNPA should give out some of the lands acquired by the government back to the local residents to develop their own recreational facilities since the government has not yet provided such facilities for the people.

BNPA need to be equipped with modern tracking gadgets and devices to enable them track the few surviving species of wildlife left in the park but has migrated to the peripheries and regroup them into safe havens. It is by only this means that, the bird watching and other eco-tourism activities to resume in the area. The government could also outsource the development of the remaining forest to investors to develop the area into an eco-tourism site so as to benefit both local and international LR participants as well generating revenue to the state for further rural development.

Lastly, the study recommends that the two district assemblies that have jurisdiction over the study areas should include in their development plan measures that ensure comprehensive infrastructural development that includes the provision of leisure and recreational facilities.

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