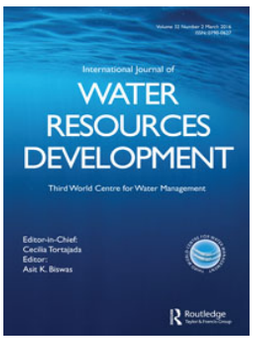

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The impacts of dams on local livelihoods: a study of the Bui Hydroelectric Project in Ghana

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The construction of the Bui Dam was expected to boost socio-economic development in Ghana. This article examines the impacts of the project on the livelihoods of the local people. Data were collected using a mixed-research approach and a case-study design. The study finds that, while there have been significant improvements with respect to resettlement and compensation issues as compared to the earlier dam projects in Ghana, there are still some shortfalls. It is recommended that agriculture be improved by providing extension services and inputs to improve food security and the economic status of the local people.

Keywords: Bui; dams; Ghana; hydropower project; livelihood; social impacts

Introduction

Dam projects have been implemented to provide single or multiple benefits such as provision of hydroelectricity, creation of waterways, flood control and provision of water for agricultural activities, especially in drought-prone regions (Biswas, 2012; Terminski, 2013; World Commission on Dams [WCD], 2000; Yüksel, 2009). Nevertheless, worldwide studies of dams and other watershed development projects have shown that their implementation often comes with negative environmental, social and economic impacts (McManus et al., 2010). Perhaps the most serious of these impacts are the displacement and relocation of people who live within and around the proposed dam sites (Terminski, 2013). Globally, the construction of dams has accounted for the physical displacement of between 40 and 80 million people (WCD, 2000). This number might be greater if those who are later forced to move due to the downstream impacts of dams were included (Richter et al., 2010).

Over the years, a number of new dams have been constructed in developing regions like Africa, and many are still currently under construction or at the planning stage (International Rivers, 2010; King & McCartney, 2007). In Africa, dam projects are envisaged to improve energy security as well as to provide a reliable supply of water for drinking and irrigation purposes (Lautze & Kirshen, 2007; McCartney, 2007). However, some of these projects have had adverse environmental and socio-economic impacts, and rarely have they been able to improve the living conditions of the affected local population

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(Bazin, Skinner, & Koundouno, 2011). In most cases, the implementation of dam projects has led to increased poverty, food insecurity, health problems and property loss amongst people living in the catchment area (Gwazani et al., 2012). This is because, more often than not, the negative impacts of dams are not totally envisaged, or are completely disregarded at the planning stage, sometimes due to lack of transparency or effective stakeholder participation (King & McCartney, 2007). In view of the benefits and the negative impacts of dam projects, scholars are divided over whether new dams should be constructed or avoided (Biswas, 2012). Several studies have been conducted on the impacts of dams around the world (see e.g. Hanyona, 2005; Kioko, Elias, & Ayiemba, 2012; Maitra, 2009; Scudder, 2005; WCD, 2000). In the literature, however, there is no consensus on the actual impacts of dam projects on local communities (International Rivers Network [IRN], 2006; WCD, 2000).

This study examines the impacts of the newly constructed Bui Hydroelectric Project in Ghana on the livelihood of local communities in the project area. The objectives of the article are to ascertain the main socio-economic livelihood activities affected by the project and to examine the effects of the Bui Resettlement Planning Framework – resettlement and compensation – on the livelihoods of the local people. The study aims at providing in-depth knowledge of the impacts of this new dam project. It could also serve as a decision-supporting guide for governments and dam funders in the design and implementation of future dam projects.

Dam debate in Ghana: the Bui Hydroelectric Project

Ghana depends hugely on hydroelectricity for household and industrial use. The sources of hydro energy are the Akosombo and Kpong Dams, constructed in 1966 and 1982, respectively. These two power plants together provide 1180 MW of power for the country (Energy Commission, 2012). The construction of both dams affected the livelihoods of the local population in several ways. For instance, more than 88,000 people were displaced and had to be resettled (Gyau-Boakye, 2001; Miescher, 2012; Tsikata, 2006). There were also many irregularities associated with the compensation schemes. Other problems were related to health and loss of sacred and cultural places.

The non-hydro sources of power in Ghana are mainly the Aboadze thermal plants (550 MW); Sunon-Asogli Power (200 MW); Tema Thermal Power Plants 1 and 2 (159.5 MW); and Mines Reserve Plant Diesel (80 MW) (Energy Commission, 2012; Hensengerth, 2011). But the power from these sources is not enough to provide the energy required in Ghana. Consequently, the country has experienced frequent power cuts, blackouts and load shedding in recent years (Miescher & Tsikata, 2009; Sackey, 2007). Despite these challenges, it was projected that domestic and industrial consumption of power in Ghana would rise from 7235 GWh in 1997 to 11,953 GWh in 2020. This implies a need to increase power generation in the country (Environmental Resources Management [ERM], 2007a).

As part of the measures to meet this power demand, Ghana became a signatory to the West African Power Pool agreement in 2000. The aim was to boost power supply within the Economic Community of West African States through building energy production facilities and interconnecting the electricity grids of member countries (Pineau, 2008). Construction of the West African Gas Pipeline to facilitate power supply from Nigeria was one of the measures to solve the energy crises in the region.

Another measure to boost energy production in Ghana was the construction of a third hydropower dam at Bui Gorge, a project which had been in the pipeline since the 1920s but

had failed to materialize for political and economic reasons (Hensengerth, 2011; Miescher & Tsikata, 2009; Okoampa-Ahoofe, 2009). In 2001, the government of Ghana reactivated plans to begin the project, but once again was not successful, because the World Bank and other multilateral financial partners declined to sponsor the project due to its perceived social and environmental threats, including the flooding of Bui National Park (Benjamin, 2007). A breakthrough was finally reached in 2007, with the government of Ghana signing an engineering, procurement and construction agreement with a Chinese company (Sinohydro) and a French consultancy firm (Coyne et Bellier) to construct the dam (Ampratwum-Mensah, 2011; ERM, 2006). The entire project was made up of a 1,000,000 m^3 roller-compacted concrete gravity dam with a full supply level of 183 m. It had a maximum height of 110 m from the foundation and two saddle dams, with a reservoir area of 444 km^2 at full supply level. When the dam was fully operational, it would generate an estimated 400 MW of power, mainly to the northern grid, to supply parts of Central and Northern Ghana. This was envisaged to bridge the north–south development gap in Ghana (Osafo-Kissi & Akosa, 2009). The project is being managed by the Bui Power Authority (BPA). The initial estimated cost of the project was USD 624 million (Bui Power Authority [BPA], 2011). Two external sources of funding were a concessional loan of USD 263.5 million from the government of China and a buyer's credit of USD 298.5 million from China's Exim Bank. The remaining USD 62 million was provided by the government of Ghana (Ampratwum-Mensah, 2011; BPA, 2011).

Before commencement of the project, per requirements to meet national and international environmental standards, an environmental and social impact assessment was carried out. This included determining the feasibility of the dam as compared to other alternative energy sources (ERM, 2007a). The assessment outlined some of the potential adverse environmental, social and economic impacts of the project and how they could be minimized (Alhassan, 2008; BPA, 2011).

The implementation of the project was expected to promote socio-economic development in Ghana. The construction of the dam formed part of the projects under the Energy Commission's Strategic National Energy Plan to expand and sustain electricity supply in Ghana between 2005 and 2025 (Hensengerth, 2011; KPMG, 2012). The 400 MW of power that would be generated from the dam would enhance the security of electricity supply in the country (BPA, 2011).

In addition, the Bui Dam project envisaged the construction of a fishing harbour and a 30,000 ha irrigation development scheme to expand agricultural production to improve food security within the dam catchment area and the nation at large (Boateng, 2014; BPA, 2011). Also, as part of the repayment of the loan used to fund the project, the government of China agreed to purchase 30,000 tonnes of Ghana's cocoa at the present world market price of cocoa for 5 years, beginning when the dam starts to operate (Hensengerth, 2013). This was expected to create a ready market for cocoa production to increase the country's foreign exchange earnings and improve the livelihoods of cocoa farmers. At the local level, the project was expected to provide benefits such as improvement in social infrastructure like good roads, schools and hospitals that would boost the local economy (Chris, 2006).

However, both national and international environmentalists and human right activists opposed the project, in view of the potential negative environmental, health and social impacts of the project on the local population (World Rainforest Movement, 2001). They argued that the perceived positive benefits mentioned above were overstated, and that the potential negative effects (such as displacement of

communities, dispossession of land, disruption of traditional values and impoverishment of the dam-affected people) were deliberately underestimated by the dam advocates to make the project more attractive to international sponsors (World Rainforest Movement, 2001). Moreover, while the original estimate was that only 859 people would be displaced by the dam, recent statistics released by the dam authorities show that 1216 were displaced, an excess of 40% (Ampratwum-Mensah, 2011). In spite of these concerns, the government pushed ahead with the planning and construction of the Bui Hydroelectric Project (Hensengerth, 2013).

Methodology

The study area

The study was carried out in seven communities displaced by the construction of the Bui Hydroelectric Project. The communities included Bui, Bator/Akanyakrom, Dokokyina, Brewohodi, Lucene, Agbegikuro and Dam Site) (Figure 1). The resettlement process was divided into two phases. Phase 1 was carried out in 2008. In this phase, four of the communities (Brewohodi, Lucene, Agbegikuro and Dam Site were relocated to the Jama resettlement camp. The camp is close to Jama, the host community. In Phase 2, Bui, Bator/Akanyakrom and Dokokyina were resettled in the Bui resettlement camp.

The most populated community is Jama, with about 1500 inhabitants, followed by Bator/Akanyakrom with 437. Agbegikuro has a total population of about 133 (BPA, 2011; ERM, 2006). The population in the study area is composed of different ethnic groups, namely Ewe (the predominant population in Agbegikuro and Bator/Akanyakrom), Mos (predominant in Jama), Akan, Valaga, Gonja, Grushie, Banda and Dagarti. It is important to mention that the Ewe are migrants from the Volta Region who settled in their present location to fish after being displaced by the Akosombo Dam project in the 1960s (ERM, 2007a; Tsikata, 2006). The Dagarti are also migrants, mostly from the Upper West Region of Ghana. The Dagarti and the remaining ethnic groups predominantly practise farming as their main source of economic sustenance. The selection of the communities was purposively done to ensure that the findings of the study are representative of the different economic and socio-cultural characteristics of the study population.

Data collection

Primary data were collected using a mixed-research approach and a case-study design. The purpose of the combined method was to facilitate the collection of quantitative and qualitative data for the study and to capitalize on their respective strengths. The fieldwork was conducted between June and August of 2011. The quantitative data was collected by administering questionnaires (see the appendix for details) to household heads in the selected communities. A household is defined as "a person or group of persons, who live together in the same dwelling, share the same house-keeping arrangements and are catered for as one unit" (Ghana Statistical Service, 2008, p. 4). Two main types of sampling techniques were used. Stratified sampling was used to categorize the households based on their community of residence prior to resettlement. Simple random sampling was then used to select respondents from each stratum for questionnaire administration. A total of 139 respondents were interviewed, 110 from the resettled communities (39 from Bator/Akayakrom, 11 from Dokokyina, 30 from Bui, 13 from Agbegikuro, and 17 from Brewohodi) and 29 from Jama.

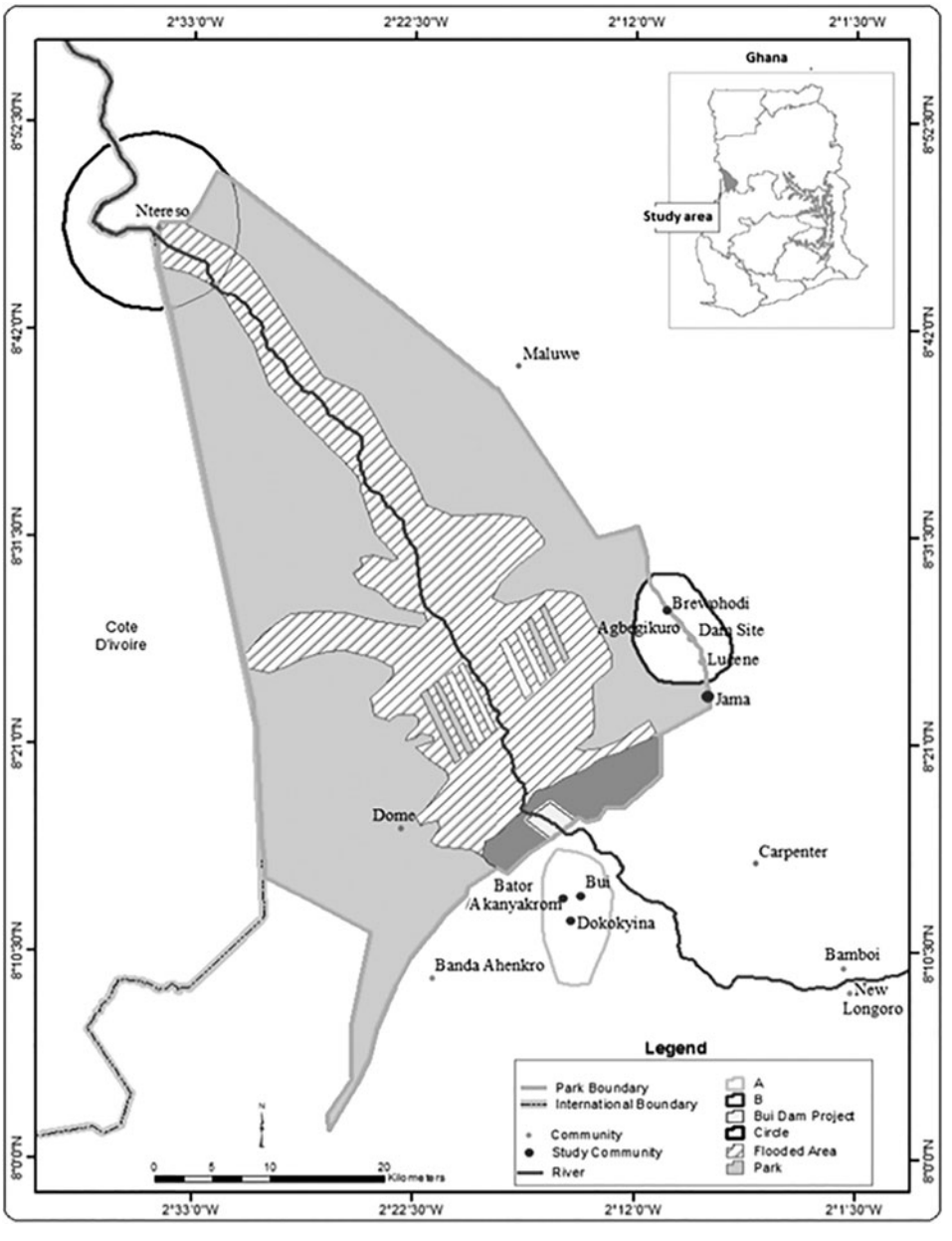

Figure 1. Location of the Bui dam: A, Bui resettlement camp; B, Jama resettlement camp.

Qualitative data were collected using semi-structured and in-depth interview guides. In addition, four separate focus group discussions were held, in Bator/Akanyakrom, Dokokyina, Jama and Agbegikuro, to explore some of the issues discussed in the questionnaire. This also helped generate data from different voices and perspectives. Each of the groups was composed of between 8 and 10 people. The smaller sizes of focus groups facilitated easy handling of groups and promoted in-depth discussion. An expert interview was also held with the environmental officer for the Bui project. Interviews were

conducted in Akan (Twi), the local language, widely spoken in Ghana. Prior to the interviews, the participants' consent was sought to record the discussion.

Quantitative data obtained from questionnaires were edited, cleaned, entered into computer software and analyzed using the Statistical Package for the Social Sciences (SPSS), version 20.0. They were then imported into Excel to generate descriptive data and to make all statistical computations. The qualitative data were also transcribed and analyzed using thematic analysis based on the objectives of the study.

Results and discussion

Impacts on existing economic activities prior to commencement of the Bui project

Before the dam was constructed, fishing and farming were the main economic activities in the communities that were to be resettled. Fishing was the main income-generating activity for the people of Agbegikuro and Bator/Akanyakrom. As can be seen in Figure 1, the two fishing communities were situated very close to the Black Volta River. Agbegikuro was about 30 metres from the river, and Bator/Akanyakrom about 40 metres. According to the chief fisherman in Bator/Akanyakrom, the close proximity to the river provided the fishermen easy access to carry out fishing activities. Before the commencement of the dam, the seasonal flooding of the river occurred between June and November (ERM, 2007a). The fishermen reported that the flood regime increased the fish stock in the river between November and March. According to them, during this peak fishing period, each fisherman would earn an average of GHS 500 (about USD 320; 1 GHS = USD 0.64786 as of 15 September 2011) in a week. The money was used to cater to the economic, social and health needs of household members. Some of the catch was also exchanged directly for foodstuffs from the neighbouring farming communities. This created some degree of social interdependence between the fishermen and the farmers.

The fishermen stated that fishing activities have declined drastically since the commencement of the dam project. The decline in fishing was attributed to limited accessibility to fishing sites and to changes in downstream river flow. This is because the locations where the fishing communities were resettled are several kilometres from the section of the river where they used to fish. A 68-year-old man in Bator/Akanyakrom complained about this situation in the following terms:

> Even to go to the riverside is a problem; you have to walk for longer distance.... For fishermen who are old and cannot walk like me sitting here, even if you carry me in a palanquin, by the time I get there I will be tired and cannot do any fishing. So only the energetic ones can still do some fishing.

An alternative could have been fishing in the downstream of the river, which is closer and accessible from the Bui resettlement camp. But according to the fishermen who have explored it, this is not possible because the impoundment of the dam has reduced the flow rate of water in the downstream. Also, the BPA has a practice of opening the spillways of the reservoir to allow excess water to flow, without any prior notice to the fishermen. This practice has often resulted in the river carrying away their fishing nets and canoes, as this fisherman at Bator/Akanyakrom said:

> All our fishing boats and materials are there in the water. The problem is today you put your net here and the next day no matter how early you go there, you find your net in a different location very far from where you set the fishing net the previous day.

The decline in fish catch due to limited access to the riverside has contributed to the collapse of the fishing industry in Bui. This is in contrast to the findings of Hart (1980),

Mudzengi (2012) and Scudder (2005), who found that the construction of the Akosombo Dam in Ghana, the Kariba Dam between Zambia and Zimbabwe, and the Siya Dam in Zimbabwe led to expansion of the fishing activities among the local people. The decline of the fish catch in Bui has precipitated changes in household dietary practices; households in the two fishing communities no longer eat traditional meals prepared mainly from fish. Also, the decline in fishing at Bui has led to other cultural and economic effects apart from the nutritional shifts. In both Agbegikuro and Bator/Akayankrom, it was reported that prior to the commencement of the project, they used to celebrate a community festival which involved communal fishing. The catch from the communal fishing was distributed among people within and outside the communities. But due to lack of access to fishing sites, they can no longer celebrate the festival. There was a cascade of economic effects due to the decline in fishing in Bui. The major effect is that the fishermen are unemployed. This has in turn affected the economic activities of the women fishmongers, who used to get their stock from the fishermen to supply markets within and outside the local area. As a result, 43% of the fishermen and 28% of the fishmongers have shifted to farming, which is not their traditional occupation.

Before the relocation, farming was the main economic activity in Dokokyina, Bui and Brewohodi. The farmers operate on smallholding basis, with farm sizes ranging from 0.4 ha to a little over 1.4 ha. Farming is generally dependent on the seasonal rainfall pattern. Unlike fishing, farming has rather remained fairly stable, with only a minimal decline in the number of farmers since resettlement. This is probably because the BPA allocated new farmlands to the resettled communities immediately after relocation, which enabled them to continue with their farming activities.

Still, some farmers in all the farming communities reported that they faced many challenges in the new locations which have undermined their household food and economic security. Farmers at the Bui resettlement camp complained that farmlands in the new locations are less fertile and thus cannot support the tuber crops like yam and cassava which are their traditional crops. Also, the fixed size of farmland (0.8 ha) allocated to each household has put stress on the farmers who wanted to make larger farms. Additionally, some of the farmers interviewed in the Bui resettlement camp claimed they had not been given enough time to harvest their produce in their former settlement before the filling of the dam's reservoir started. As a result, many of them lost their crops. In Bui, 54% of the household heads said that as a survival strategy they resorted to buying foodstuffs from outside markets in Bungase and Banda Ahenkro to feed their household members – a practice they were not used to. This practice has therefore increased the economic burden on the households of resettled farming communities. However, farmers in Jama indicated that their yields have remained almost the same. They grow more of grain crops, like maize, and cucurbitaceous plants, such as squash and gourd, than yam and cassava. This could be an indication that the resettled farming communities may have challenges that are due to their relocation and their not planting the crops suitable to the new farmlands.

Newly created economic activities from the construction of the Bui Dam project

Employment opportunities outside the agricultural sector in the study communities were reported to be rare. Before the construction of the dam, the few existing ones were in the teaching, health and wildlife sectors (ERM, 2007b). The local people generally have lower levels of education, so they lacked the skills and competences to compete for the jobs created by the dam construction. The prestigious formal jobs were the preserve of expatriates and the Ghanaian educated folk who immigrated to the construction site from

the urban areas. Even though the Bui Dam project was envisaged to create around 3400 job opportunities (BPA, 2011), those who have benefited most are these immigrants. Only 14 of our 139 respondents were employed at the construction site. They were mainly taken on as unskilled labourers such as carpenters, masons, drivers, welders, metal benders and security officers, attracting lower salaries and wages. Also, the local workers complained about poor safety precautions at the workplace and the precariousness of their posts. During an interview, one of them said, "The least mistake you make, they show you the exit." Moreover, most of the local employees had temporary contracts, which will terminate when the dam construction is completed. The results in Bui are in contrast to the experience from the Manantali Dam in Mali, where construction of the dam created jobs for the local people (Diop & Diedhiou, 2009). However, they substantiate the WCD (2000, p. 99) argument that dam construction creates seasonal jobs, which require proper planning in order to sustain the lasting benefits from the 'boom phase'.

Another important new economic activity that has emerged is trade and commerce around the construction site. This has boomed because of the presence of many immigrant workers and tourists at the ongoing project. Also, the area has become more accessible because the road transportation network in the area has been significantly improved since the project began. This has created indirect jobs for the local women, the majority (70%) of whom were those previously engaged in fishing. They have now become mostly food-sellers, while others sell groceries.

Resettlement and compensation issues

As already stated, about 1216 people were displaced by the Bui Dam project. This number is far below the 80,000 and 8000 people who were displaced during the construction of the Akosombo and Kpong Dams, respectively, in Ghana (Gyau-Boakye, 2001; Tsikata, 2006). Per the requirements of the World Bank and Ghana's resettlement standards, those displaced by the Bui Dam project needed to be resettled in a way that would improve their livelihoods (ERM, 2007a). However, a majority of the resettlers interviewed indicated that they were not given a choice of where they would like to be relocated. For example, respondents from the two fishing communities reported that they requested to be relocated very close to the river, but that was not accepted.

In terms of housing, the BPA provided new housing to all the households relocated to the Jama and Bui resettlement camps (Figure 1). The two camps are about 9 km apart. This study shows that there has been a remarkable improvement in the housing compensation scheme for the Bui Dam project as compared to what pertained during the Akosombo Dam project. During the Akosombo project, the resettled people were provided with a so-called core house, made up of structures with one completed room (irrespective of the household size), a concrete foundation, blocks, timber and roofing sheets. The occupants were expected to complete the building (Chambers, 1970; Miescher & Tsikata, 2009; Raschid-Sally, Akoto-Danso, Kalitsi, Ofori, & Koranteng, 2008). By contrast, in the case of the Bui Dam project, households were resettled in completed block houses, roofed with zinc aluminium sheets. The number of rooms allocated was based on what could be termed the plus-one principle. That is, households were provided with one more room than they had had before. The new structures also have a living room, a storeroom, a toilet and a bathroom.

In general, satisfaction with the new homes was high among the resettled community members. Only 19% of the resettlers were not satisfied with their new house. They complained that the houses were built with low-quality materials. They also said that the

roofing was poor and leaked when it rained. Nevertheless, a majority, constituting 81% of the respondents, were satisfied with the new housing because they owned the title to the new house. While this is an improvement over both the Akosombo and Kpong resettlement schemes, in which the resettlers were not given legal title to their new houses (Tsikata, 2006), the Bui dam resettlers were not satisfied with the location of their new settlements. They also felt that the dam has impoverished them as a result. In one interview, a household head from one of the fishing communities said, "I would have preferred being relocated into a squatter house close to the river to enable me to have easy access to the river than living in plush houses located far away from the river."

The project also led to development of social amenities such as electrification and improved roads in the resettlement sites, host community and in surrounding towns, which were previously lacking in the area. Two modern school blocks were built by the BPA in the Bui resettlement camp, for primary and junior secondary schools. However, in the Jama resettlement camp, no new school blocks were constructed. Instead, because of the proximity of the camp to Jama, the BPA expanded the existing school structures in the host community. No health facility was built in any of the camps, but the health centres in Jama and Bungase (about 3 km from the Bui resettlement camp) were upgraded to provide services to the resettlers. Although residents in the resettled community were happy they had gotten electricity, they also complained about the increasing cost of electricity bills – they were not used to paying electricity bills – and felt that this had increased their economic burdens. In the host community and the Jama resettlement camp, residents complained that the health centre was short of health personnel and medicine. They also complained about overcrowding in the school classrooms in spite of the expansion work by the BPA.

Land tenure system and land compensation

The impoundment of the Bui Dam flooded large tracts of farmland. Ninety-eight of the 139 respondents lost their farmlands in the filling of the dam reservoir. Figure 2 shows the sizes of farmlands lost by respondents.

The BPA was supposed to compensate people whose farmlands were flooded. But before delving into the details of how compensation was resolved and its shortfalls, it is important to first highlight the land tenure arrangement in the Bui area. Most of the farmlands are skin/stool lands,[1] with few family-owned lands. In the case of the latter, family members have customary freehold in the land. On the other hand, migrants and

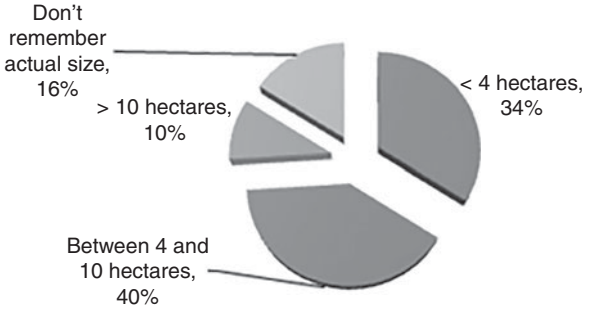

Figure 2. Distribution of area of respondents' farmland submerged by the reservoir.

other non-members of the land-owning skins and families access land through traditional methods such as renting, or through the *abunu* and *abusa* share-cropping systems (ERM, 2007a).[2]

The farmlands that were flooded by the dam were either skin or family lands. According to the Bui Resettlement Planning Framework, only the farmlands that had been evaluated prior to the flooding would be compensated (ERM, 2007b). All the farmlands would be compensated with new farmlands. The new farmlands would be allotted to landowners and farmers with proof of documentation of land grants. The Bui land compensation scheme was chosen to avoid some of the land compensation failures of the earlier dam schemes in Ghana (ERM, 2007b).

An important improvement of the Bui land compensation scheme over the Akosombo scheme is that all the properties except land earmarked for inundation were assessed by the Land Valuation Board before the commencement of the project (ERM, 2007b). The actual compensation comprised both land and cash, as had been adopted in the Kpong project in Ghana (Tsikata, 2006) and the Manantali Dam in Mali (de Wet, 2000). Farmlands were compensated with new farmlands in the new location, while other land properties like economic trees were to be compensated in cash. The land compensation was completed in 2012. The advantage of land-for-land compensation was that it minimized situations where those who received cash mismanaged it, making them poorer than before, as was experienced in the Akosombo project (de Wet, 2000; Miescher & Tsikata, 2009). However, 55% of the farmers interviewed in Bui said that adequate cash compensation would have enabled them to diversify from farming to non-agricultural jobs such as trading and drinking bar operation. Another 45% of the farmers said that cash compensation would have enabled them to engage in the aforementioned non-agricultural activities in addition to other agro-enterprises like bee-keeping and grass-cutter rearing to provide them with alternative sources of income.

Unlike the Akosombo and Kpong projects, in which the resettlers were not given ownership title to their new lands (Tsikata, 2006), those in Bui were granted legal title to the new farmlands. However, each household was given the same area, 0.8 ha, regardless of the area held before. This led to a general decline in the average size of farmland, which is a major concern to the resettlers who are farmers. They argued this has limited their ability to start bigger farms. They also felt that the reduced size of farmland prevented them from cultivating economic tree crops like teak and cashew, which used to be alternative sources of income. Others envisaged that this would lead to land scarcity in the area for the future generations.

A major novelty of the Bui compensation scheme compared to the Akosombo and Kpong projects is related to monetary compensation. Apart from cash compensation for loss of property, the resettlers were also given financial support. It included a resettlement grant of GHS 50 to support the resettlers' starting a new farm, and a monthly supporting grant of GHS 100, paid to each household for one year (BPA, 2011). The purpose was to provide financial security for the resettlers with the hope that, by the end of one year, they would have more sustainable income-generating sources. In Agbegikuro and Brewohodi, where the financial support ended in 2010, the resettlers reported that it was insufficient. However, the resettlers in Bui resettlement camp said the support was sufficient, but household expenditure on food had increased so they could barely save part of the money for unforeseen circumstances. In Bator/Akayankrom and Agbegikuro, the fishermen stated that the resettlement assistance would have been more beneficial to them if BPA had provided them fishing equipment instead of giving them the monetary grant to start new farms, since farming was not their traditional occupation.

Cash compensation for loss of property at Bui, as with the Akosombo and Kpong dams, is faced with several loopholes. In the latter cases, land and other properties were evaluated after the land was flooded. This led to compensation irregularities and prolonged conflicts between the affected communities and the government (Ghana News Agency [GNA], 2014a). Currently, legal inquiry is ongoing to examine payments perceived to be fraudulent compensation made to some chiefs and individuals in the affected communities under the Judgement Debt Commission (Ghana News Agency [GNA], 2014b). In the case of Bui, properties like crops, trees and farmlands expected to be affected by the project were surveyed and valued prior to the filling of the reservoir (ERM, 2007b). The total amount to be compensated for economic trees (mostly cashew plantations) was USD 1,093,413, while compensation for food crops (cassava and yam) was estimated at USD 88,267. Yet, no cash compensation had been made at the time of the fieldwork in 2011.

Effects of the Bui Dam project on out-migration

The research was carried out in the period when the construction of the project was still ongoing, and therefore it is difficult to give a detailed account of the effects of the project on emigration of the local population. In general, most respondents in the host community have plans to stay, because they expected the area to "soon open up to tourist activities when the dam is completed".

However, the story is not the same for the resettled communities. For instance, in the two fishing communities, the fishermen said they were awaiting the construction of the proposed Bui fishing harbour so that they can reinstate fishing activities. They emphasized that if this expectation was not met, they would embark on a 'second relocation' in which they will abandon the present settlements to settle on other accessible areas of the reservoir to carry out their lucrative fishing activities. At Bator/Akanyakrom, the chief said:

> We still do not like this place.... Now that the river is impounded, you should not be surprised to one day come here and see that all the youthful population is all gone.... They will relocate and you will come to meet empty structures here.

There are similar reports among the people who were resettled during the Akosombo Dam project in 1966. Most of the resettlers moved to settle at the banks of the Volta River, where they could fish or farm (Okoampa-Ahoofe, 2009; Tsikata, 2006). Moreover, 25% of the young men interviewed had plans to travel to the cities. Others mentioned moving outside Ghana to seek greener pastures. In contrast, the elderly men and women interviewed said that they have no immediate or long-term plans to move, because of family reasons and lack of the initial capital they would need to move.

Conclusions and recommendations

This article has discussed the impacts of the Bui Dam project on the livelihoods of the people of the resettled communities and how resettlement and compensation issues were handled. The project was implemented to improve electric power generation and irrigation to improve food security in Ghana. It was also expected to provide several benefits to facilitate socio-economic development at the local and national levels. The implementation of the project since 2007 has coincided with a period when dam projects are expected to meet stricter environmental and socio-economic standards. Therefore, the design and implementation of the project were intended to meet national and international requirements. The study found that the commencement of the project has led to improvements in local infrastructure (road network, drinking water, health and education

facilities) and creation of new job opportunities for at least a few of the local people. Also, the Bui compensation and resettlement schemes are significantly improved as compared with the Akosombo and Kpong experiences in Ghana. In spite of these improvements, some of the shortfalls encountered in the earlier dam projects have remained. Much still remains to be done to improve the livelihoods of the affected communities. Based on these findings, therefore, the following recommendations are made.

To improve agriculture in the new settlements, in addition to financial support for farming, dam project implementers should provide farmers with affordable farm inputs. Also, skill training and services of agriculture extension officers would help the farmers adapt and improve their farming activities in the new locations. This would help sustain the food security of the resettled households.

Future dam projects must also be accompanied by support schemes and small-scale economic activities such as industries and handicraft businesses. These would provide alternative jobs for both the resettled and host populations. Also, existing economic activities such as fishing can be diversified by, for instance, introducing cage fishing and aquaculture. This would enable the local people to retain their traditional occupations and minimize the tendency of emigration, especially among the active population.

Finally, future relocation schemes must try as much as possible to avoid disruption of the traditional economic activities and cultural practices of the local communities as experienced at Bui, Akosombo, Kpong and elsewhere. This could be achieved by consulting and actively involving the local leaders during the planning and implementation phases.

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Notes

1. This refers to land that belongs to the whole community, past, present and future generations. Tenure arrangements are governed by traditional and customary norms and practices. The titular heads of the traditional communities who own the land are known as skins or stools.
2. *Abunu* involves sharecropping on an equal basis (50:50) between the landowner and tenant; *abusa* is sharecropping on a 1:2 basis between the landowner and tenant.

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Appendix

Appendix 1. Types of information collected during the field survey.

Theme on questionnaire	Specific information collected
Background information of respondents	Gender, age, occupation, household size, level of educational attained
Socio-economic impacts of the Bui dam project	Main occupation before and after resettlement, effects of project on occupation, employment, ancestral relations
Loss of property and compensation	Land property and size, compensation for land, size of new land, loss of other forms of properties and compensation, satisfaction with compensation
Description of old settlement*	Socio-economic facilities, water, toilet, school infrastructure and health centre
Description of new settlement*	Socio-economic facilities, water, toilet, school infrastructure and health centre
Description of housing units before and after resettlement*	Type, number of rooms, toilet facility, electricity
Satisfaction with the new settlement*	Comparison of settlements before and after resettlement, rating of satisfaction
Relationship with the host or resettled community	Economic, social and cultural activities performed together, experience of discrimination
Knowledge and participation in project management	Grass-roots representation in decision making, representatives, roles of representatives, satisfaction with involvement in project management

*Questions specifically designed for resettled household respondents