



Socioeconomic Impact of Development Projects on the Livelihood of Farmers: A Case Study of the Bui Dam Hydroelectric Project

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Authors' contributions

This work was carried out in collaboration among all authors. Author Amankwah Emmanuel worked on the protocols, data collection and analysis and first draft. Authors ADT and Awafo Edward worked on the literature, structured and reviewed the paper and worked on other parts of the manuscript. All the authors read and approved the final manuscript.

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ABSTRACT

The development of major social projects such as hydroelectric dams, roads and mining often result in the loss of properties and sometimes relocation of the affected people or communities. This paper examined the impact of the Bui Dam Hydroelectric project on the livelihood of the people affected, especially farmers in the Bono Region of Ghana. The paper also reviewed the Environmental and Social Impact Assessment (ESIA) report of the project in line with the Environmental Protection Agency requirement, examined the compensation and the living conditions of the farmers in the affected communities. Interviews and focus group discussions of farmers in four communities were conducted which was later followed by the administration of questionnaires to seventy-five (75) farmers. The data obtained from the questionnaires were analyzed using descriptive statistics such as frequencies, percentages and Excel software for the development of charts. The review of the ESIA report of the Bui dam showed that an extensive ESIA was conducted with only few lapses outlined in the text. The interviews and the questionnaires revealed that the farmers who were relocated have problems with land

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acquisition, soil fertility and irrigation facilities when they were moved to their new location. There were also concerns about inadequate payment of compensations and unfulfilled promises. However, about 97.3% of the respondents were comfortable at their new location because of the proximity to health services, access to good roads, nice buildings and provision of some basic social amenities such as light and water, as well as possible business and employment opportunities. The paper makes suggestions for improving compensations and resettlement schemes in Ghana.

Keywords: Environmental and social impact assessment; compensation; farmers' livelihood; Bui hydro project; resettlement.

1. INTRODUCTION

Environmental Impact Assessment (EIA) is a comprehensive project management tool to collect, analyze and evaluate environmental effects of a proposed project and it is mainly conducted on major projects inter alia hydroelectric dams, mining and road construction which are likely to have negative impacts on the environment and people's lives. It is also a key planning and decision-making tool that supports sustainable development. It is usually undertaken to ensure accelerated economic growth, improve health, income and living standards of the poor majority [1].

Every national project is expected to provide relief and benefit to the citizenry especially projects such as building of roads, hospitals, hydro power and water treatment plants that serve as social amenities to the people. According to the World Bank, the conduct of EIA is to improve project selection, siting, planning, design and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and also enhance positive impacts throughout the project implementation [2]. Investments in such projects are also expected to provide jobs, create employment and expand the economy. These large projects generally affect farmers who depend on the land for their livelihood and income. Apart from the social impact of major projects on the livelihood of farmers who lose their farms, sustainable agriculture will also suffer resulting in food insecurity and hunger. EIA which is a tool to ensure better living standard of farmers in the affected communities is sometimes seen as a tool to keep them in poverty rather than one that improves the quality of lives and the environment [3], thus; the need to evaluate the EIA of the Bui Dam hydroelectric project and investigate the living conditions of farmers at the Bui city.

The conduct of EIA of major projects, which leads to resettlement, comes with various challenges, especially for farmers who lose their farms. These resettlement processes have resulted in the loss of many properties and caused the lives of many who depend on farming activities to be worsened [4]. A typical example is the relocation of the people of Atuabo and its environs in the Tarkwa Municipality in the Western Region to the New Atuabo along the Tarkwa-Aboso road by the Tarkwa Goldfields Limited, as a result of the introduction of surface mining in the area. Even though compensations were made, most of them could not survive on the money given to them because they did not have the skills and knowledge to start a new venture. Others could not also manage their moneys properly. Some of the farmers who were compensated for the loss of their crops and farm lands could not also get new lands for farming and thus had to resort to other activities. Unfortunately, life later became very difficult because they could not survive on their new businesses due to lack of experience and technical know-how. The same story applies to thousands of farmers who have been resettled through similar and related projects. It is therefore not strange that the World Bank advocated for an important policy standard against the impoverishment of a displaced population [5]. Sometimes the challenges, the displaced people face, result in conflicts among the community members due to frustration, loss of properties, jobs and family ties. Even though the Bui hydroelectric project will provide additional 400 MW power to boost electricity generation in Ghana, from history, the construction of hydroelectric dams has come with various challenges including resettlement and payment of compensations. The construction of the Akosombo dam affected about 80, 000 people and the Kpong dam project also affected nearly 7,000 people. History has also repeated itself as the resettlement communities around the Bui project

also have similar challenges based on which this research was carried out. The construction of the Bui dam directly affected about 6 communities of about 1, 270 people [6].

This research is thus to draw attention of policy makers, development partners, stakeholders and interested parties about the need to consider the livelihood of farmers who get affected through such projects.

1.1 Resettlement Schemes and Compensations

The main problem associated with resettlement is compensation as the money given is sometimes inadequate. De Wet [5] indicated that the very things needed to make resettlement work, such as money, staff, skills and critical time, are often lacking or insufficient in the planning and implementation of resettlement schemes. This situation, therefore, affects those who are resettled as they hardly could live on the money given them and sometimes it is very difficult for most of the rural folks to properly manage the money given to them. Small scale farmers who over the years have hitherto depended on regular income from their farming activities suddenly stop getting regular income and find themselves in a precarious situation having bulk sum of money to manage. Cernea [7] argued that compensation, however, important in both theory and practice, alone is insufficient and unable to achieve restoration and livelihood improvement. The farmers' ability to adopt more profitable diversification strategies is determined by the skills, location, capital, credit and social connections they have to pursue other activities [8]. The skills and credit aspect are very important to ensure sustainability of their livelihood without which sustainable agriculture could be jeopardized irrespective of the money given to farmers. The sustainability of livelihoods during displacement and resettlement depends on the compensation packages given; which should include skills, accessibility to market, business training and suitable location. According to Chambers [9] other challenges with resettlement may include land tenure systems, relationship between settlers and local traditional authorities, political resentment and loss of properties in the area of origin. All these affect communities that are resettled, including farmers and their lives mostly become worse off. It is therefore necessary to devise mechanisms to improve the

livelihood of those who get resettled, especially farmers; by providing them with skills and training, irrigation schemes, fertilizer subsidies, improved seeds, access to land and markets for their farming activities. Apart from those who are displaced and resettled, farmers who lose their lands and crops also go through similar ordeal. Unfortunately, farmers and affected communities do not know how to negotiate for a better deal or are not even given any opportunity to negotiate. The question is who negotiates compensations, who determines how much compensations are to be paid, how is compensation calculated and upon what considerations? For farmers, the challenges associated with the payment of compensations are evidenced during the construction of the Koforidua Water Project and the destruction of cocoa farms by the Ghana Rubber Estate Limited (GREL) in the Eastern and Western Regions, respectively, among others [10]. According to UNDP [11] the principles and modalities for assessing compensation appear unsatisfactory. It is out of these issues of compensations that the Food and Agricultural Organization (FAO) and other bodies are working to create awareness among farmers about their right to negotiate compensations for projects that affect them [12]. Even though public hearings are organized, due to the technical nature of most of the reports, such public hearings are often reduced to discussions on just the job opportunities and economic benefits the project promises, which hardly get fulfilled.

Another important aspect of the resettlement scheme that requires serious consideration is the traditional structure of the affected communities and the need to involve them in the entire resettlement plan to avoid unnecessary confrontation. The EIA conducted for the James Bay hydroelectric project in Canada could not anticipate the impact on native people in the La Grande River watershed, because their studies failed to include local value sets in their analysis to evaluate predicted impacts [13,14]. Scientific findings and predictions are important but local knowledge cannot be ignored in such cases. In Ghana where scientific data is sometimes not available, indigenous knowledge could be used to make better judgment. Indigenous knowledge could be used to supplement scanty scientific data through extensive public consultations, community hearings and focus group discussions during the conduct of the various stages of the EIA.

According to Chambers [9] during the construction of the Akosombo hydroelectric dam, the authorities regrouped several isolated villages at a new site to take advantage of common public facilities without due consideration of the differences in culture, chieftaincy issues, power structures, and traditional values. This situation resulted in acrimony and lack of social cohesion among the settlers during the Volta Resettlement Scheme in 1960. Resettlement plan must at all cost take into consideration indigenous knowledge by involving the affected people at all the project phases. Such situations therefore require that an extensive EIA is conducted with the affected people strategically involved in all discussions from inception to completion of projects, properly

supported and compensated, and alternative livelihood provided. It is therefore very vital that the fundamental UN principle of the right to Free, Prior and Informed Consent (FPIC) is strictly enforced in the negotiation of compensations [15].

1.2 Environmental and Social Impact Assessment (ESIA)

Environmental and Social Impact Assessment (ESIA) is a very important component of every major project. It is conducted to minimize the adverse impact of the proposed project or undertaking on the affected people and the environment. The impact is identified and possible mitigation measures are taken.

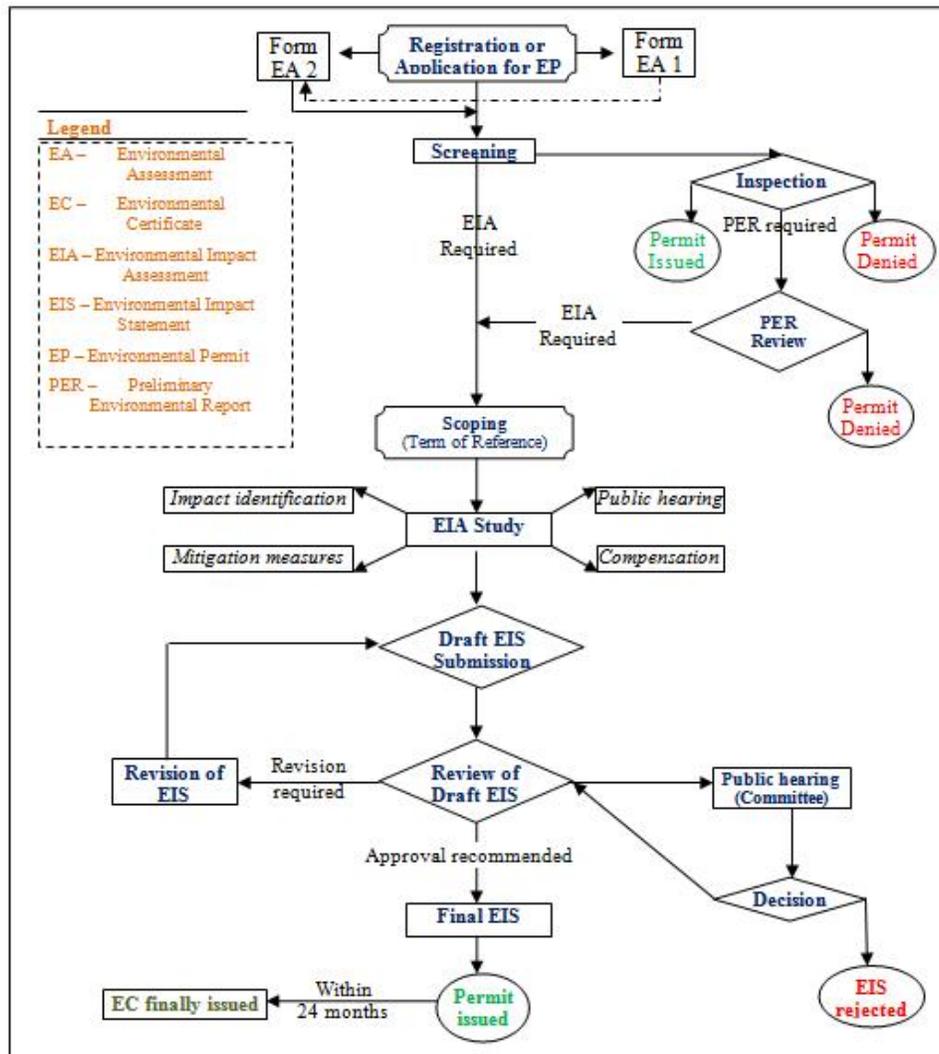


Fig. 1. EIA process [13]

The general public and the affected communities are invited to participate in the ESIA processes through public hearings to discuss the project's potential impacts, proposed remedial measures, and socio-economic benefits to the state and the communities. Unfortunately, such fora are mostly limited to the job opportunities and economic benefits the project promises and do not provide clear understanding of the long term impacts due to the high technical nature of such discussions [11]. The Environmental Protection Agency (EPA) is the body mandated by an Act of Parliament (ACT, 490), to ensure that every proposed project likely to impact negatively on the environment is subjected to EIA before the project is implemented. The proponent must go through a series of processes (Fig. 1) to get the project approved. The basic processes include:

1. Project Registration
2. Screening
3. Scoping
4. Environmental Impact Statement

The first step of the EIA process is to register the proposed project with the Environmental Protection Agency (EPA). The Agency will then undertake screening of the proposed project to determine whether EIA is required. If EIA is required, the other processes are carried through as indicated in Fig. 1. A proper conduct of the EIA is to ensure that the proposed project becomes beneficial to

the affected communities and the country as a whole [1].

2. MATERIALS AND METHODS

2.1 Description of the Study Area

The Bui resettlement camp (Bui city) is located in the Tain District of the Bono Region and consists of several affected communities as a result of the Bui hydroelectric project. The district has a population of 108,386 people with 58.14% living in the rural areas [16,17]. The district lies within latitudes 7°30 and 8°45 North and longitudes 2°52 West and 0°28` East. The Bui project is close to the Bui National Park (Fig. 2). The major occupation of the people in the area is agriculture including fishing, charcoal production and animal husbandry as well as tourism. The Bui city is made up of communities such as Dokochina, Bui, Akanye korom, and Bator, among others. The people are of various ethnic groups such as the Ligbi, Banda, Dagarti, Bono, Gonja, Ewe, Fante, Bator and Kulangho. These people are peasant farmers, dependent mainly on rain-fed agriculture. They cultivate yam, cassava, guinea corn, groundnuts and cashew; and also rear livestock. Others engage in fishing in the Black Volta. The establishment of the Bui National park also creates employment for the people through tourism. Hunting around the park was restricted due to the enforcement of the wildlife protection laws.

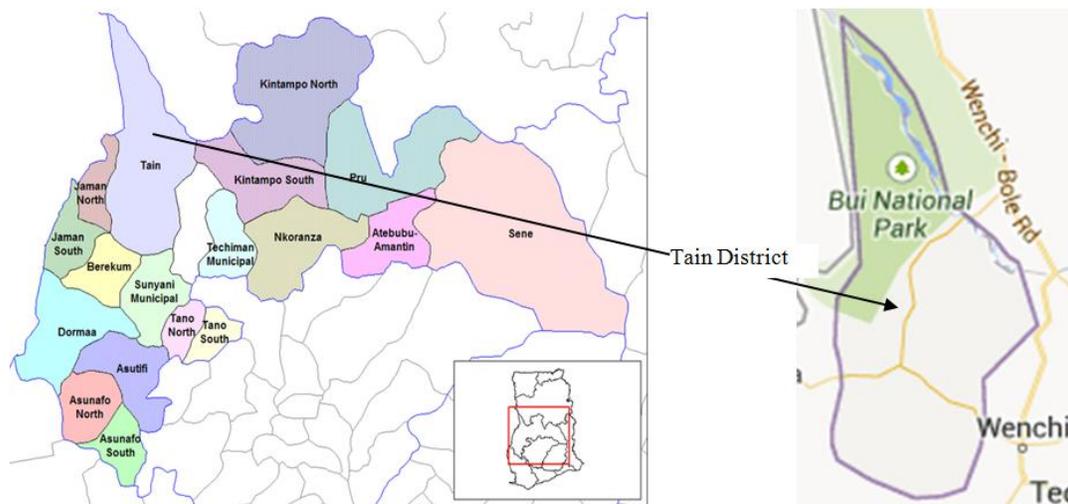


Fig. 2. Map of the study area
Source: Google maps

The three main vegetation covers in the area are savannah woodland, riparian forest and grassland with savannah woodland scattered with trees being the most dominant vegetation type [6]. The rainy season in the area is unimodal, starting in April and ending in October; with a peak between August and September. The average annual rainfall is about 1140 mm with maximum and minimum temperatures of 30°C and 26°C respectively. The maximum relative humidity is 87% and the minimum is 58% in January, with February and March being the hottest months of the year [18].

2.2 Methods of Data Gathering

The research conducted involved three main stages which are the review of the ESIA report of the Bui dam project conducted by the Environmental and Resource Management Limited (ERML) -UK; field observation and initial interviews with farmers, and the administration of questionnaires to substantiate the findings obtained during the interviews at the Bui city. Other relevant secondary materials were also reviewed to support the literature of the study. The ESIA report was reviewed in line with the EIA procedure which includes Screening, Scoping, Preliminary Environmental Assessment, Determination of significant impacts and suggested Mitigation, Environmental Impact Statement, Review, Monitoring and Auditing. The Environmental Protection Agency (EPA) procedure for EIA and the 1999 EIA regulations in Ghana were also used to support this research.

The field work began with farmers in the Bui city who were randomly selected from the localized communities and interviewed to find out their livelihood situation at the new site. The interviews were conducted with staff from the Ministry of Food and Agriculture at Tain. The interviews were face-to-face and in all about 30 farmers from different communities who have been relocated to the new community were interviewed. Key aspects covered by the questionnaire include: compensations, standards of living, availability of facilities and challenges. Based on the results of the interviews, questionnaires were developed to substantiate the qualitative research earlier conducted. The questionnaires mainly focused on the socio-demographic profile of the farmers, including gender, age, marital status and educational background. Another area of focus was the general farming systems,

practices and support. The final aspect of the questionnaires covered compensation, living conditions, provision of social amenities as well as challenges the displaced farmers face at their new residency. Seventy-five (75) farmers were purposefully sampled from the four resettled communities and given the questionnaires. About 15-20 farmers were randomly selected from each community. Some of the farmers were assisted to answer the questionnaires, especially those who could not read properly.

The data obtained from the questionnaires were analyzed using descriptive statistics such as frequencies, percentages and excel software for the development of charts. The results obtained were combined with the qualitative information gathered earlier to help draw a conclusion of the study.

3. RESULTS

3.1 Review of ESIA of Bui Hydroelectric Project

The review of the ESIA of the Bui hydroelectric Dam project showed that ERML followed the four steps set out by EPA in the conduct of EIA in Ghana which includes Project Registration, Project Screening, Scoping Report and Environmental Impact Statement and also carried out the EIA in accordance with international standards. There was an extensive work done by ERML and, thus; no doubt about the quality of ESIA conducted. There was an extensive public consultation, the impact and mitigation measures were quite exhaustive, even though technical issues, such as analysis of drought and stream flows as well as climate related issues; including soil management were not addressed in detailed.

3.2 Responses from Interviews with Farmers and Questionnaires

From the questionnaires, it was observed that out of the 75 respondents, 81.3% were male while 18.7% were female. The age groups of the respondents between 30-39 years were 26.7%, 40-49 years (52%) and above 50 years were 21.3%. The other results from the interviews with farmers and the questionnaires generated are presented in Table 1 and Figs. 3, 4 and 5 respectively.

Table 1. Educational background of respondents

Education	Frequency	Percentages (%)
Tertiary	0	0
Senior High School	10	13.3
Junior High/ Elementary School	30	40.0
Non-Formal	35	46.7

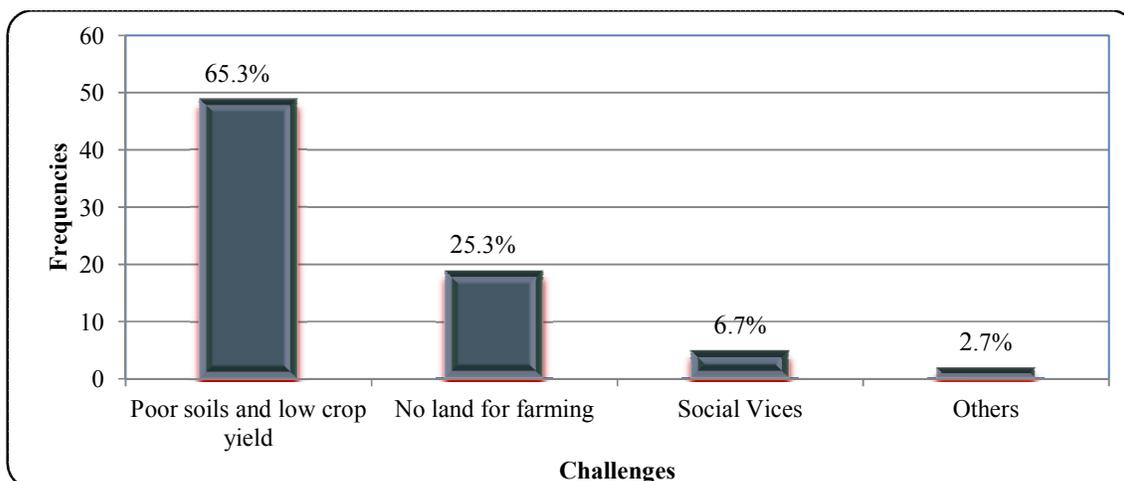


Fig. 3. Challenges the respondents face at the resettlement camp

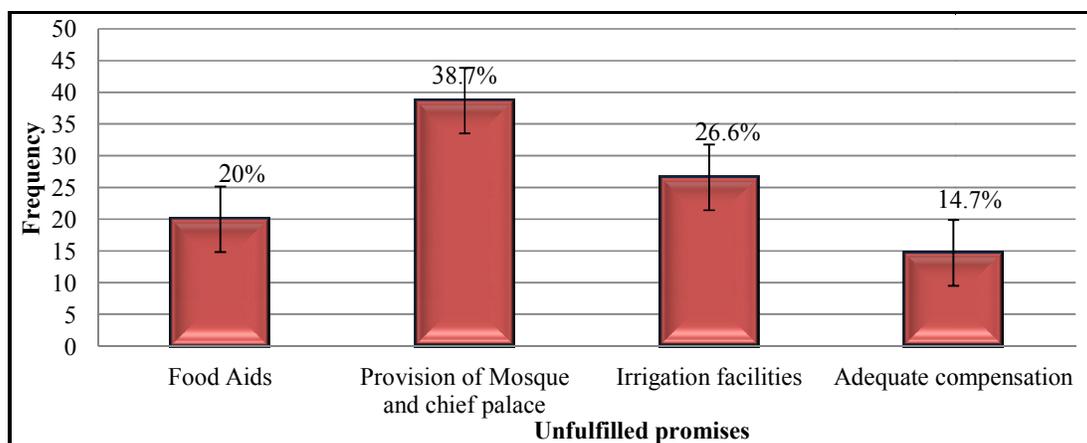


Fig. 4. Unfulfilled promises at the Bui city

4. DISCUSSION

4.1 Review of ESIA of Bui Hydroelectric Project

In line with the requirements of the Ghana Environmental Protection Agency (EPA) Act 490 of 1994, the Environmental Assessment Regulation of 1999, Legislative Instrument (LI) of 1652 and to meet international financing requirements for the Bui project, an

Environmental and Social Impact Assessment (ESIA) study was carried out by ERML - UK and SGS Environment, Ghana. The mandate of the team was to come out with Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP) and a Resettlement Planning Framework (RPF) of the Bui dam project as outlined in the policies, safety procedures, and guidance of the World Bank Group [2]. The conduct of every ESIA was expected to support

the affected members of the communities in the area of adequate compensations and other packages to make them cope with the post relocation challenges. The idea of EIA is to minimize the impact of any proposed project on the environment and to improve upon the lives of the affected communities to ensure sustainable development. Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs and aspirations [19]. Unfortunately, the payment of compensation especially for farmers focuses more on the net economic value of the land and crops lost and do not consider the inter-generational interest in the land [11]. According to Ayee et al. [20] there are uncertainties and complexities that revolve around the interpretation of fair and adequate packages in the various legal provisions on land acquisition which affect the negotiations of compensations between concerned stakeholders and the proponents. Such situations may result in land litigation, conflicts and several challenges among the future generations.

4.2 Interview with Farmers

The earlier interviews and focus group discussions conducted with farmers show that they do not have sufficient land for farming and suffer competition with the indigenous communities of the area. The forceful take-over of land without adequate compensations may sometimes leads to agitation and conflict [21] especially when farmers are relocated from their

traditional communities to join another community as in Bui City. For this reason the farmers complained of unfair treatment as they do not have the capacity to negotiate for a better compensation as indicated by Ayee et al. [20]. Most of the farmers, as at the time of the survey, also complained that they had not yet been paid compensation for loss of their farm lands after almost four years and those paid were also not satisfied with the compensation paid which support [22] that farmers were dissatisfied with compensation packages for loss of farm lands. Some of those interviewed were also disappointed that many of the promises and assurances given to them, such as irrigation dam, provision of improved seeds and new technologies including compensation had not been fulfilled. Some of them think that the old settlement was far better as they easily had access to food and other basic needs, which are missing in their new settlement. Other infrastructural promises such as worship centres and chief palace had not also been fulfilled and these challenges including inadequate compensations will affect the livelihood of the farmers. Fortunately, some companies, having realized the problem, have taken steps to increase the compensations that are paid to farmers [23].

4.3 Responses from Questionnaires Generated

The introduction of the questionnaires was to triangulate the findings from the qualitative study. The results of the questionnaires showed that majority of the farmers are males which

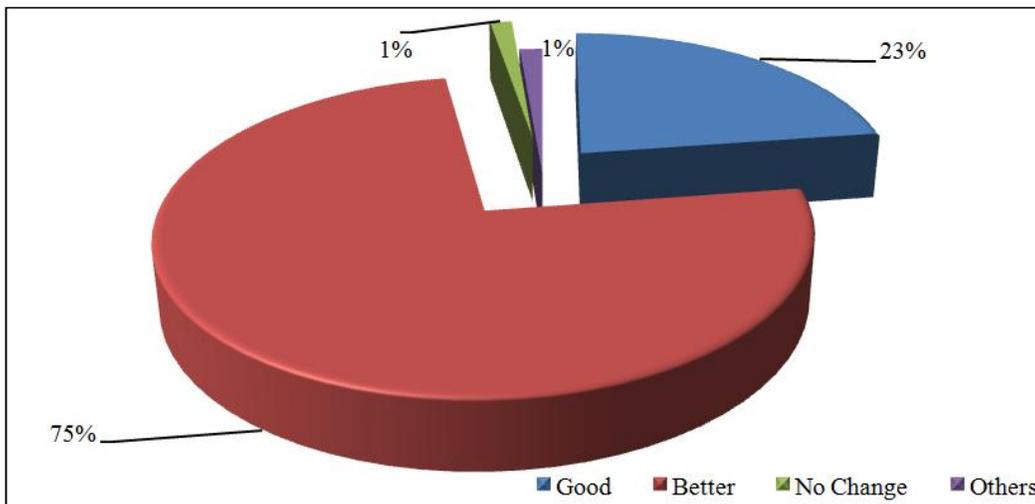


Fig. 5. Living conditions of respondents (n=20)

may be an indication that majority of them are migrants especially from the northern part of Ghana who have moved to settle for farming. The age variations also show that majority of the farmers are people with dependents, thus; may require adequate compensations to enable them cater for their family members which is in line with GNA [23]. It was also observed that about 98.6% has been in the farming business for over 7 years and therefore depend on agriculture for their livelihood and anything short of their farming activities will jeopardize their livelihood.

In Table 1, it could be observed that about 53.3% had some form of education while 46.7% did not have formal education. None of the respondents had tertiary education. More than half of the respondents could read and write, which is very important for proper farm practices. Concerning compensation, it was observed that 97.3% of the respondents lost some form of property and were paid or were yet to be paid compensations, but coincidentally almost all of them complained that they were not fully satisfied with the compensation offered to them. This confirms [5] assertion that compensations normally paid is always insufficient to transform the lives of the displaced people. The recent agitations during the construction of the Koforidua water project and the GREL Ghana Ltd. among others across the country attest to that fact as in [10].

When the respondents were asked whether they liked their new environment, 97.3% answered in the affirmative and the reasons given were accessibility to health services, good roads, buildings and business or job opportunities. Even though the farmers like their new place because of the above amenities, land tenure and low fertility issues were raised and needed government assistance to enable them improve their livelihood.

From Fig. 4, about 65.3% had problem with poor soil fertility resulting in low crop yields, while 25.3% had problem with land for farming. It is clear from here that farming activities are the main concerns of the farmers in their new settlement. Since their main occupation is farming, this situation will affect the farmers and worsen their living conditions. It is therefore, important that issues concerning access to land and soil infertility are addressed to enable the farmers remain in business to help improve their living standards. This really justify

the concerns raised during the 2nd Ghana Dam Forum in 2009 when members raised issues such as access to farmlands and sizes, soil fertility challenges for farming activities, infrastructural and social amenities as well as loss of property and adequate payment of compensations [24]. It is therefore vital that concerns raised before or during resettlement programmes are taken seriously as in the case of the 2nd Ghana Dam Forum. Most of the concerns raised are exactly what is happening at the Bui city. To the farmers, provision of fertilizers, improved seeds and irrigation facilities are as important as the compensation paid.

The research also revealed that, most of the farmers like their new settlement due to the proximity to health services, access to good roads, nice buildings and provision of some basic social amenities, such as light and water. As indicated in Fig. 5, over 95% admitted that they admire the new environment because of the social amenities and some compensation possibly received, despite the fact that there are still some promises not yet fulfilled. It is therefore, very important that the concerns about access to land and soil infertility are considered to help the farmers continue their farming activities. Besides, it is important to provide skills training and credit facilities to help them seek alternative sources of living since the compensation alone is not enough to improve their lives [7].

5. CONCLUSION AND RECOMMENDATIONS

A developmental project such as the Bui hydroelectric dam to provide additional 400 MW generation to the national grid is a worthwhile venture which will improve electricity supply in the country. The provision of hospital, tarred roads, new buildings, water and electricity to the Bui city as well as employment opportunities have tremendously improved the landscape of the area and the lives of the resettled communities. However, compensations paid have not been satisfactory since the money paid is hardly enough to sustain the beneficiaries; especially farmers who lose their farmlands. The impact does not only affect the farmers, but dependents and generations to come. The payment of compensations for lost land, crops and livestock, and destroyed properties, must therefore be critically looked at especially for farmers.

The research has clearly established that payment of compensations alone is not enough. There is therefore the need to assist farmers to secure farm lands and provide them with basic inputs so as to better improve their livelihood and ensure sustainable food production. The provision of targeted skills training and credit facilities for farmers who will want to start new businesses is very important for restoration of the farmers. Adequate compensations should be paid when their lands are destroyed or taken from them. Education and capacity building of farmers to adequately negotiate for the payment of compensations should also be paramount. Small scale farmers must be given special preference when it comes to the payment of compensations due to their dependence on farm lands and the production of food to feed the growing population.

CONSENT

As per international standard informed and written participant consent has been collected and preserved by the authors.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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