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## ***Viewpoint – Butterflies vs. Hydropower: Reflections on Large Dams in Contemporary Africa***

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**ABSTRACT:** The current acute needs for improved water resources and energy management in the contemporary development of Africa has renewed the interest in large dams in recent times, especially in the energy sector, because of the Millennium Development Goals (MDGs), concern about climate change, the variability in crude oil prices and alternative sources of funding for large dams. So, the rethink about large dams as an energy source in the face of fluctuations in the cost of crude oil and climate change is also based on finding cheaper and renewable sources of electricity. However, the renewable credentials of large dams, and their compatibility with sustainable development, are disputed. Using the Akosombo dam and the Bui dam project – both in Ghana – as case studies, this paper analyses the potential and significance of large dams within the ambit of Africa’s contemporary development. The paper argues that despite criticisms of large dams and the promotion of alternatives, large dams are still very important to Africa’s development as they are technologies with well known positive and negative socio-economic and environmental impacts which could be mitigated. The alternatives to large dams, in contrast, have relatively unknown long-term socio-economic and environmental impacts. In addition, there is scepticism among local people and other stakeholders about the alternatives to large hydropower dams because of the impression that some western-backed non-governmental organisations (NGOs), some northern countries, and some multilateral and bilateral institutions are intentionally seeking to undermine significant development in Ghana and other African countries.

**KEYWORDS:** Dams, alternatives, imperative, subversion, development, Ghana

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### **INTRODUCTION AND BACKGROUND**

The current acute needs for improved water resources and energy management in the development of Africa has renewed the interest in large dams in recent times, especially in the energy sector, because of concern about climate change, the Millennium Development Goals (MDGs), variable crude oil prices, and alternative sources of funding for large dams.

The desire to achieve the MDGs and other socio-economic development objectives has led to the re-engagement of the World Bank and other regional banks in financing large water infrastructure in the last few years (World Bank, 2004; Grey and Sadoff, 2007). Meanwhile, concessionary/low-interest loans are now available from China, with its growing financial reserve of about US\$1.3 trillion a year (Hilton, 2008), to construct large dams and other infrastructure in Africa and countries in the global South (Wild and Mephram, 2006; Kaplinsky et al., 2007). This Chinese funding has made it easier to pursue dam construction in Africa, which had not been possible for more than a decade.

Climate change and increasing crude oil prices have also led to a rethink about large dams as a means of reducing global carbon emissions. For instance, the use of thermal energy for electricity generation is both expensive, because of increasing costs of crude oil, and environmentally damaging, because of emissions of climate change inducing gases, which is worsened by increasing shifts to coal use. So the rethink about large dams as an energy source in the face of increasing costs of crude oil and climate change is based on finding cheaper and renewable sources of electricity.

However, the renewable credentials of large dams and their compatibility with the principles of sustainable development are disputed. While IRN (2007), WWF International (2007) and REN21 (2008) perceived large dams as non-renewable sources of energy, the WEC (2003, 2004 and 2005) and IEA (2000, 2002 and undated) consider them as renewable. Thus, the dispute surrounding the sustainability of large dams, and whether they are renewable sources of energy, is at the centre of the debate on large dams.

This opinion paper unpacks some of the narratives about large dams and their alternatives in Africa's development trajectory and discourses. The opinion in this paper is based on findings of research<sup>1</sup> with stakeholders in dams in Ghana.

### **Large dams: A development imperative**

The need for large dams, which proliferated in the 1950s and 1980s, is based on the provision of irrigation, water supply, flood control, and hydropower generation. The ability of countries to provide these services is correlated with self-reliance, independence and economic and social progress. For instance, the transfer of water to drier areas is exemplified in the western United States, where huge water transfer facilities and large dams provided a stable water supply to states like California and made them habitable. Also, the sophisticated developments brought about by the Tennessee Valley project, which significantly transformed huge swathes of land susceptible to devastating floods into an industrial hub, and prosperity in Western Europe, particularly in Sweden, Norway, and Switzerland, can partly be traced to hydroelectric power and flood control dams. The recent emergence of Spain as a major producer of irrigated horticultural produce is also facilitated by the large dams scattered around the country (Gupta, 1998; Van Robbroeck, 1999). These examples and many more demonstrate how large dams have been used over several decades by different nations to meet their development objectives.

Likewise, Ghana's Akosombo dam has been perceived by Ghanaians as a development imperative for the country's socio-economic development, in spite of some social and environmental impacts. Socio-economic development, in this context, relates to the ability to transform the natural resources of a country to serve the needs of society by increasing economic activities, well-being in social life, provision of infrastructure through the use of technology, and to move the nation towards what a large dam stakeholder in Ghana called "evolutionary results" in human and natural resources development.

### **The technological tyranny of large dams**

However, the perception of large dams as a development imperative is challenged by a paradigmatic shift in water resources development, from a supply-led and control-based approach to water development – the "hydraulic mission of industrial modernity" (Allan, 2003) – to increased concern for environmental and ecological impacts and the economic and social costs of the construction of large dams (Gleick, 2000; ODI, 2002). Consequently, the negative impacts of large dams on both society and nature have generated a perception of large dams being a 'tyranny of technology' (Goodman and Chant, 1999; Loose, 2001) and a development disaster.

The tyranny of technology of large dams is based on concerns about how they dismember rivers, dislocate entire communities, fracture social cohesion, and damage the dignity and mental psyche of those affected, leading to untold and irreparable hardships, yet without any corresponding benefits (Goldsmith and Hildyard, 1984; Pearce, 1992; Rich, 1994; McCully, 1996; Usher, 1997; Gleick, 1998). These problems with large dams are especially acute in the semi-arid and arid area of developing countries where the "hydraulic mission proved to be readily exportable – in the second half of the twentieth century" (Allan, 2003).

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<sup>1</sup> This research is the basis of a PhD thesis submitted by the author to the School of Development Studies, University of East Anglia, Norwich.

This tyranny of technology hinges on the inability of large dams to deliver on anticipated benefits as well as their social and environmental impacts. Socially, the debate on large dams is shaped by an unequal contest between the powers of states and hapless local people affected by the construction of dams. The premise of the unequal power relation is derived from the perception that dams are centrally conceived without consultation of those to be affected; leading to inequitable distribution of the benefits of dams (Goldsmith and Hildyard, 1986; Pearce, 1992; McCully, 2001; Adams, 2001). As a result, some people who resettled due to the construction of large dams feel short-changed. For instance, the construction of the Akosombo dam led to the resettlement of about 80,000 people in 52 settlements and also had huge socio-economic impacts on people in the lower Volta, downstream of the dam. Environmentally, the construction of the Akosombo dam is said to have significantly altered the ecosystem of the lower Volta basin because of reduced water flow. There is now high saltwater intrusion in the lower Volta which has rendered agriculture production in the area close to being impossible and has also affected lagoon fisheries. These are some of the issues around the tyranny of technology of large dams in Africa.

The tyranny of technology perception emanates from the unbridled use of inappropriate and unsuitable technology without due and careful consideration of its medium- to long-term implications (Goldsmith and Hildyard, 1986; Pearce, 1992; McCully, 2001; Adams, 2001). This is because technology is assumed to be one of the key solutions to underdevelopment, especially of the global South. Though technology may bring about huge benefits to the people of the global South, just as it has done in the North, technological application through undemocratic top-down procedures may bring about undesirable outcomes. Thus, large dams are seen as technological tyrants and not as development imperatives, if they are not acceptable to the people they are meant to serve.

The criticism of large dams as technological tyrannies because of their social and environmental costs has coincided with a surge in non-governmental environmental activism. This, coupled with some resistance from local people affected by the construction of dams, plus the perception that most ideal dam sites in northern countries were exhausted, led to a policy shift away from supporting such large infrastructure development in the global South, especially in Africa; this led to a significant decline in the development of large dams in the late 1980s (Bergeret and Bister, 2003). But this criticism of dams has sometimes been perceived in Africa as a deliberate attempt to subvert the developmental aspirations of the South, thereby denying them the infrastructure needed for nation building and for boosting development and their ability to participate effectively in the global economy. This, therefore, confines Africa and other developing countries to the economic periphery as 'drawers of water and hewers of wood' and the raw material basket of the global North.

### **Subversion of the development interests of Africa**

This perception about the subversion of development in Africa arises from the aggressive campaigns against the construction of large dams in Africa and other developing countries, and the promotion of alternative technologies such as wind and solar, especially by western-based NGOs. This has raised the ire of stakeholders of some African large dams because there is the perception that while some western countries with large dams are enjoying their benefits, there is a campaign to deny these benefits to developing countries. This perception of subversion is strengthened by the fact that the greater percentage of technically and financially feasible large dam sites in the west has been used, while those in Africa are yet to be fully exploited.

This perception of subversion of the development of southern countries is reinforced by the high consumption of northern countries. According to Giulianom (undated), the average US citizen uses 50 times more steel, 56 times more energy, 170 times more synthetic rubber and newsprint, 250 times more motor fuel and 300 times more plastics, compared to the average citizen of India. Van Robbroeck (1999) asks whether the "poor South should stop developing" and not aspire to attain a comparative level of living standard, and be consigned to be the suppliers of raw materials for the extravagant

lifestyle enjoyed by the rich North, partly allowed by the decades of construction of large dams from which they continue to benefit. He adds that their development and progress no longer depends on the construction of new dams.

### **Aims of this paper**

The debate over whether large dams are good or bad and their future role in different societies is complex and provides a paradigmatic case of the contemporary debates over sustainable development in general. Unfortunately, in recent years, the debate on large dams has become increasingly polarised and at times conflictual. It has become more a reflection of the frustrations of one side rather than a constructive engagement between different stakeholders on the difficult choices associated with managing water resources (Asmal, 1999). The capacity of large dams to generate controversy has taken centre stage in the drama of 'hydro-politics' (Gupta, 1998). As a result, the debate on large dams has been caught between the imperative to assure flood control, supply of water, and electricity to domestic, agricultural, and industrial users, and the desire to ensure that human conditions and environmental considerations are not ignored in the process.

Large dams, therefore, encapsulate the choices and dilemmas faced by every society (Asmal, 1999). Consequently, the debate over large dams is a debate about the very meaning, purpose, and pathways for achieving development. In any case, all development choices and decisions on dams and their alternatives must respond to a wide range of expectations, objectives, and constraints (WCD, 2000b). It is within this contested background and context that Ghana's Akosombo dam and the Bui Hydropower Project are analysed here as case studies. This paper analyses the results of field surveys on Ghana's existing Akosombo dam and insights on how its performance subsequently influenced the construction of the US\$650 million Bui Hydropower Project (BHP) funded by China. The analysis of these two large Ghanaian dams is undertaken within the context of the country's political and socio-economic aspirations. With this analysis, the paper highlights the role of large dams in contemporary Africa and examines the three main perceptions of large dams; development imperative, tyranny of technology, or the subversion of the development of southern countries.

### **LARGE DAMS AND GHANA'S SOCIO-ECONOMIC DEVELOPMENT**

Dams are major features of Ghana's post-colonial development strategy. The construction of the Akosombo dam was part of 'The Ten Great Years 1951-1960' national development plan designed to rapidly modernise and transform an agrarian economy to an industrial-based economy in order to abolish poverty, ignorance, and disease in modern Ghana within a generation (BBC2, 1994; GIS, 1960). According to President Kwame Nkrumah, Ghana's progress should be measured by the improvement in people's health, the number of children in schools and the quality of education they receive, the availability of water and electricity in towns and villages, and the happiness people take from being able to manage their own affairs (Dzorgbo, 2001). This is because the "welfare of our people is our chief pride, and it is by this that my government will be asked to be judged" (ibid: 148). These ideals of well-being envisaged by Nkrumah are the basis of international programmes like the MDGs today. In order to achieve the above goals, the Akosombo dam took centre stage among the huge infrastructure investments that President Kwame Nkrumah championed. President Nkrumah believed that electricity from the Akosombo dam would be the base for Ghana's industrialisation and economic growth (BBC2, 1994). Though some of these lofty ideals of President Nkrumah are yet to be achieved, the Akosombo dam is recognised as being at the core of Ghana's socio-economic and industrial development.

### **Contribution of the Akosombo dam to Ghana's development**

The overall socio-economic significance of the Akosombo dam to most Ghanaians is not in doubt, but there is a mixed perception among some people, particularly, the resettled people. To illuminate the

socio-economic contribution made by the Akosombo dam to Ghana's development in perspective, some areas examined in this paper are: the Volta River Authority (VRA), managers of the Akosombo dam; financial performance of the dam; fisheries from the lake; and hydroelectric power supply for socio-economic development.

"The provision of electric power was an immense benefit to the development of Ghana" said Burke Knapp, former Senior Vice President of the World Bank and the "life wire of Ghana" development. For instance, almost 60% of Ghana's economy (NDPC, 2005) rely on mining, manufacturing, and commercial sectors – employing a significant number of Ghanaians – utilised more than one third – about 2629 Gigawatt hours (GWh) of the 6822 GWh – of electricity generated in the country in 2003 (GSS, 2003; Energy Commission, 2005). Also, electricity from the Akosombo dam made Ghana "one of the most industrialised countries" in West Africa together with Nigeria and La Cote d'Ivoire, and allowed the country to reach over 50% electricity coverage – the highest in sub-Saharan Africa. These are some of the benefits that the Akosombo dam helped Ghana to achieve.

The VRA's financial performance in operating the Akosombo dam is thought to be successful. Analysis of VRA financial data indicates that operating profit was positively sustained from 1985 to 1999, and that net profit was positive from 1985 to 1996 with yearly variations. One determinant of the yearly variation in financial performance is rainfall variability. In 1983, the operating and net profits were in the red – by approximately GBP 600,000 and GBP 700,000<sup>2</sup>, respectively (VRA, 2003). This negative return was due to the severe droughts experienced in 1981/82 which affected the water level of the Akosombo reservoir and thereby operations of the dam. This means that there is a correlation between the financial performances of the VRA and rainfall, further illustrated in the low rainfall and lower profitability observed in 1987, 1990, 1994, 1998, and 2000.

In recent years, however, the VRA has experienced significant net losses. This is because of the addition of thermal electricity generation to supplement hydroelectricity from the Akosombo dam to meet the increase in demand. So it can be deduced – particularly from 1997 to 2005 – that the net loss in comparison to the operating profit was because the VRA was partly financing thermal power construction (1997 to 2000) and operation (2001 to present, with the most recent figures being for 2005).

Increased fish yield and fisheries-related activities in the upper portion of the Volta lake is an often overlooked outcome of the Akosombo dam. Artisanal fishing in the lake accounted for 90% – 73,000 mt of 82,000 mt – of all fish harvested from inland waters in 2003 (Sarpong et al., 2005). This almost doubled the lake fishery potential of 40,000 mt/year estimated by FAO (1991, 2005). Braimah (2001) also estimated the value of fish caught in the Volta lake at approximately US\$22.4 million. The Akosombo dam lake fishery and fishery-related activities provide employment to an estimated 300,000 people (Anon, 1993; IDAF, 2003). From this number, 80,000 are fishers and another 20,000 are fish processors and traders operating from about 2,000 fishing villages (Sarpong et al., 2005). The fishing industry has created other auxiliary jobs like carpentry for building and mending boats and canoes; traders in fishing gear such as outboard motors and fishing nets; dealers in fuel and lubricants; and outboard motor mechanics (Kofi Abban, 2005). This demonstrates the benefit of the Akosombo dam to fisheries development and livelihoods in Ghana.

The poverty profiles of 34 fishing communities further illustrate the importance of the Akosombo dam and lake to Ghanaians (Pittaluga et al., 2003). The indicators of employment of fishing communities based on availability of employment opportunities, share of the population currently economically active, working conditions, and frequency of work-related accidents, showed that, with the exception of one village, villagers experienced a "general state of well-being insofar as employment-related aspects of poverty are concerned" (ibid). A growing number of people – even those who lost their jobs in the agriculture sector – are easily absorbed into the fisheries sector and 37% of the communities surveyed showed a considerable increase in employment opportunities (ibid). This implies

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<sup>2</sup> The equivalent of €647,074 and €754,920 at current rates (x-rates.com, 2009).

that the Volta lake has significantly improved livelihoods and reduced poverty of fishing communities, which is consistent with the MDG and a further confirmation of the importance of the Akosombo dam to Ghana.

In spite of these benefits, some resettled communities have said that the benefits are inequitably distributed. Of significance to this argument is that the resettled communities were not provided with electricity until 2000/2001, which shows the neglect of the central government and VRA towards the resettled communities. This is because activities of the VRA in the area of electricity generation and distribution were focused on urban areas and large industries like the Volta Aluminium Company (VALCO). The neglect of the resettled communities emanates from the fact that there was no post-resettlement programme – including electrification of the resettled communities – in the Volta river project to be executed by the government and VRA for these communities. Because of the lack of electricity in the resettlement areas it is claimed that economic activity has been low, with poverty and impoverishment being high.

For instance, the Akosombo dam changed the ecological balance between the Volta river and its floodplain, which significantly altered the livelihoods of downstream communities. Tsikata (2006) argued that basic livelihood activities, such as lucrative creek fishing by men and highly profitable clam digging by women, were literally wiped out. Tsikata posited that programmes meant to assist the people of the floodplain were the first to suffer budgetary cuts and that even attention to downstream losses remains ineffectual, resulting in the non-implementation of recommendations of a 1996 government study on people's losses from the Volta dam project (*ibid*). Tsikata further reasoned that community losses were ignored in the early years of the Akosombo dam because economists did not pay much attention to non-market and environmental losses and, therefore, were not included in project accounting, thereby significantly reducing the employment and education capacity of the communities.

Furthermore, there were huge environmental and health costs associated with the construction of the Akosombo dam. Rahaman et al. (2004) observed that the natural environment of the area was significantly, and indeed, permanently altered, converting a river ecosystem into a lake ecosystem. Floods to the downstream floodplains were reduced, which led to the virtual collapse of agriculture and fishing (Rubin et al., 1998). Farming along the Volta was structured around the rise and fall of the river but the damming put an end to the natural cycles that had deposited nutrient-laden silts along the floodplains. Damming led to a drastic curtailment in subsistence agriculture production and animal grazing (Gorman and Werhane, 2008). The reduction in floods led to a reduction in the dispersal of mangrove seedlings while the collapse in fishing and agriculture led to an increase in mangrove cutting for fuelwood by the local communities (Rubin et al., 1998). Also water-borne diseases such as bilharzias, river blindness, malaria, and urinary schistosomiasis became public health concerns because they are common among the inhabitants of surrounding villages (Rahaman et al., 2004; Gorman and Werhane, 2008). Prior to construction of the dam, urinary schistosomiasis only affected approximately 1 to 5% of the population, but by 1979 the disease had become the most prevalent in the area affecting some 75% of the lakeside residents (Gorman and Werhane, 2008).

However, despite these negative impacts of the Akosombo dam sampled resettled communities still acknowledge the importance of the Akosombo dam to Ghana's socio-economic development. The words of one opinion leader encapsulate this perception and summarise their concerns: "the dam itself is good for development, but the treatment of the local people is the problem". This implies that the construction of new large dams in Ghana could be supported provided that conscious measures are taken to address their impacts on the livelihoods of local resettled people, downstream communities, and the ecosystem, and ensure that the costs associated with these impacts are internalised in the project accounting, which hitherto had not been the case with the construction of most large dams including the Akosombo dam. In this era, after the World Commission on Dams, the dynamics associated with the construction of large dams has changed, because there is more awareness about the impacts and benefits of large dams with different mechanisms, especially in the areas of technical

and financial aspects, among other systems, to ensure that large dams that are considered as inappropriate and risky are not constructed.

### **Ghanaians' perception of the Bui Hydropower Project**

Juxtaposed against some of the negative experiences of the resettled people affected by the Akosombo dam and the general awareness about social and environmental impacts of large dams, it was expected that the local communities to be affected by the construction of the Bui Hydropower Project (BHP) would either reject it outright or at least give it only qualified support. Instead, field interviews showed that these communities perceived the BHP as a socio-economic instrument for transforming their society and the country. This perception is even shared by some resettled communities affected by the Akosombo dam and other key stakeholders in Ghana. This implies that, in spite of the many identified socio-economic problems of large dams in Ghana, large dams are still perceived as having a significant role to play in Ghana's quest for socio-economic development.

Interviews with communities likely to be affected by the proposed Bui dam project in Ghana, and other national, local and international actors and their organisations, indicate that large dams are important to Ghana. There are high expectations among local communities to be affected by the construction of the BHP with regards to the benefits that could be obtained from the project. The benefits mentioned by the local communities include: development of infrastructure, e.g. roads, schools, health facilities, etc.; which would open the area to the rest of the country (it is currently isolated); employment; better accommodation after resettlement; fisheries; improvement in farming and well-being; and an improvement in the income of farmers with regards to their produce due to an influx of people and access to a wider market.

However, not all Ghanaian stakeholders are enthusiastic about the BHP because of some social and environmental problems. Among the social and environmental concerns raised regarding the BHP are wildlife and habitat loss within the Bui National Park (BNP) due to flooding of approximately 21% of the Park; erosion and sedimentation of the river and its banks; effect of changes in river flow on fisheries; potential proliferation of water and vector borne diseases and aquatic weeds; socio-cultural and economic impacts of resettling about 2,500 people; the biophysical, socio-economic and cultural implications associated with the likely influx of guest workers during construction; and public health issues (BKS Acres, 2001; ERM, 2007) which might not be easy to mitigate.

For instance, on the issue of the wildlife and habitat loss due to flooding of the BNP, it is argued that some rare species of flora and fauna will also be destroyed (Anane, 1999a; Titone, 2001). Of particular concern is the possible extinction of the hippopotamus amphibians (for the protection of which the BNP was established) because parts of their habitats closest to the Bui gorge will be flooded (Anane, 1999b). This was perceived as a paradox because of incompatibility between the objectives of the BHP and the BNP, which is attributed to 'planning confusion' in the country. In this context, the BHP is not an appropriate source of electricity for Ghana because of its location in the BNP and the unquantifiable impacts on its ecology and biodiversity do arguably constitute a 'tyranny of technology'.

Other stakeholders, however, do not subscribe to the argument that constructing the BHP will damage the biodiversity and ecological sanctity of the BNP. "A little more water in the park is not in itself destructive", it was said; indeed it was argued that, it might even be appropriate, in that the creation of the park was to preserve the site for the future development of the BHP. It was also felt that the BHP might help in transforming the BNP and make it more economically viable than it is now, as the environment, wildlife and ecosystem in the national park will be enhanced (Ankudey, 1999a, 1999b). It will also make the area more accessible and habitable to tourists and the local population because roads and accommodation – which are needed to promote tourism but are currently non-existent – will be provided (Ankudey, 1999a, 1999b), leading to a symbiotic relationship between the BHP and BNP.

Furthermore, all the local communities in the BNP and BHP area were unanimous that the BNP was not beneficial to them because they did not have access to its resources, as it is a strict conservation

area which limits their economic activities. So, the BHP will "serve the nation and the communities better than the park (BNP)". "In development, something will have to be destroyed for something good to come out of it", sums up the view that the BHP is a development imperative for Ghana rather than keeping the BNP.

### **ALTERNATIVES TO LARGE DAMS IN GHANA**

Some stakeholders such as the local Green Earth Organisation office and Earth Services suggested in interviews that solar, wind and mini/small hydro projects as alternatives to the BHP and other prospective large dams in Ghana (Green Earth Organisation, 2005; Earth Services, 2005). It is argued that some of these alternatives can achieve the same or even better benefits for Ghana with few or none of the social and environmental problems that could be associated with the BHP (Green Earth Organisation, 2005; Earth Services, 2005). These alternatives are, therefore, sometimes presented as more appropriate to the socio-economic development of Ghana.

However, this is contested. First, it is argued that the costs of generating electricity from these alternatives are prohibitive. For instance, it is estimated that the "cost of generating a KWh of electricity with solar power is more than 60 US cents/KWh and way beyond the capacity of Ghanaians to pay", compared to large hydroelectric power at 3 to 4 cents/KWh (REN21, 2008). Second, the alternatives cannot generate other positive benefits such as irrigation, agriculture and fisheries like the BHP. Third, wind and solar technologies as sources of electricity are not sufficiently developed to provide the quantum of electricity needed for socio-economic development (BKS Acres, 2001). There are also uncertainties about the long-term environmental impacts of wind turbine and solar projects. Obviously this will have ecological impacts, destroying vegetation and biodiversity. So, long-term environmental uncertainty and costs associated with generating electricity from solar and wind technologies do not make these feasible alternatives to the BHP.

Small hydropower generation is another alternative which has proven to be incapable of substituting the BHP as an alternative electric power source. Though small hydropower schemes continued to feature in Ghana's electricity generation plans (GNA, 2006), studies into 22 small hydropower potential sites concluded that 50% of them dry out completely and most of the rivers have their economic potential reduced considerably by pollution and siltation (Dernedde and Ofosu-Ahenkorah, 2002). Consequently, small hydro dams cannot serve as alternatives to the BHP in Ghana.

Electricity from thermal sources is a more valid alternative to the BHP (Acres International Ltd., 1985; BKS Acres, 2001; ERM, 2007). However, thermal electricity is sensitive to crude oil prices which are expensive for the Ghanaian economy to procure (Acres International Ltd., 1985; BKS Acres, 2001). The inability of the country to operate the two main thermal plants to full capacity at Aboadze and Takoradi is linked to cost of crude oil. The "costs of electricity generation from the thermal plants is about 7 to 8 cents per KWh at current production levels, reducing to about 6.5 to 5 cents/KWh at full capacity" said Wisdom Togobu (2005) head of renewable energy of Ghana's Ministry of Energy in an interview on Ghana's energy options. He further argued that natural gas from the proposed West Africa Gas Pipeline (WAGP) may further reduce costs, though it could still be higher than 3 cents/KWh from Akosombo and about 3-4 cents/KWh estimated for the BHP (ibid). This means that, in terms of capacity, thermal is an alternative to the BHP but not in terms of electricity generating costs.

Also, the use of thermal to generate electricity will lead to the increased emission of greenhouse gases, which affects climate change. For instance, the increased use of thermal as part of Ghana's energy mix amplified the discharge of carbon dioxide (CO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>) and nitrogen oxide (NO<sub>x</sub>) (Energy Commission, 2005). While, in 2000, the total CO<sub>2</sub>, SO<sub>2</sub> and NO<sub>x</sub> emissions were about 449.44 million kg, 0.67 million kg and 1.23 million kg, respectively, their levels increased to 1372.32 million kg for CO<sub>2</sub>, 2.06 million kg for SO<sub>2</sub> and 3.74 million kg for NO<sub>x</sub> in 2003 when thermal generation increased in the country (Energy Commission, 2005). CO<sub>2</sub> emission in Ghana between 1990 and 2004 increased by approximately 89%, from 3.8 Mt CO<sub>2</sub> in 1990 to 7.2 Mt CO<sub>2</sub> in 2004 (UNDP, 2007). The



increase in CO<sub>2</sub>, SO<sub>2</sub> and NO<sub>x</sub> in the country and their implications for climate change means that thermal energy is not an appropriate alternative to the BHP.

The analysis of alternatives to the BHP showed their limitations and inappropriateness in meeting Ghana's electricity requirement for socio-economic development. This is because "meeting the developmental needs of the country is the priority and should depend on what the national agenda seeks to achieve", which requires the right kind of energy, thereby making the BHP an important project for Ghana's socio-economic development (ERM, 2007).

### **THE SUBVERSION OF DEVELOPMENT IN SOUTHERN COUNTRIES OF AFRICA?**

The 'take no prisoner' opposition to the BHP by some international NGOs such as Friends of the Earth (FOE), World Wide Fund for Nature (WWF), International Union for the Conservation of Nature (IUCN), International Rivers, and others and their surrogates in Ghana because of social, environmental and economic equity concerns is perceived by some as a deliberate effort by northern countries and organisations – perhaps using these NGOs as proxies – to purposefully subvert Ghana's genuine developmental needs, thereby keeping the country in a perpetual state of underdevelopment. "The agenda of the World Bank and the northern countries are the same since they want the South to continue to depend on them" said one stakeholder. Another added that "I have got the feeling that some of these NGOs and western people want Africa to be a wild place so that they can pursue certain agendas". "They want Ghana and, for that matter, Africa to be underdeveloped so that they can come and see us in our backwardness" complained another. These statements imply that the aggressive campaigns and activities of some NGOs and their local affiliates are perceived as undermining local and national development of Ghana and other southern countries.

It has been further argued that pro-environmental and social campaigns, including those against large dams, are not based on altruistic belief in equity and social justice for local people but for the sole purposes of environmental protection and nature conservation (Chapin, 2004). This prognosis tallies with evidence gathered at the BNP and BHP sites. This is because for almost 40 years (1971 to 2008) when the BNP was gazetted as a strict conservation area, no single NGO (local or international) concerned about social, environmental and economic equity and social justice, invested in the development of the BNP, which could have helped to improve the tourism potential of the BNP or the socio-economic development and livelihoods of the people who formally existed on the park's resources but were denied access after gazetting of the park. As one senior official of the BNP observed, "we have not been able to get money to develop even the Dwija National Park (DNP) with an area of 3500 km<sup>2</sup> and where the dam (Akosombo) had already been completed". The DNP was created to protect wildlife during the construction of the Akosombo dam. One stakeholder is particularly annoyed that organisations like Friends of the Earth (FOE) and others NGOs "campaign against the dam at Bui while they enjoyed the benefits of electricity in their own homes and then visit the BNP to view the animals with their friends". "I got a letter from one white guy who said that the BNP had some rare species of butterflies, and I replied by asking why they didn't preserve the butterflies in their country" said another stakeholder. These sentiments by some Ghanaian stakeholders about the campaign against the construction of the BHP confirmed the argument by Chapin (2004) that conservation NGO campaigners are more concerned with ecosystem and ecological integrity rather than the livelihoods and development of local people. This, it was said, epitomised the subversion of the development of southern countries by some northern-based NGOs and countries.

Another basis on which large dams such as the BHP are opposed by some NGOs and western countries is the perceived lack of participation in decision making prior to the construction of dams. However, not all countries unconditionally accept the outcome of decisions resulting from participation in decision-making sessions at either the national or international level. For instance, some countries like the "US can afford to disregard international concerns about the environmental cost of climate change because they have the financial means to go alone" said a stakeholder, as shown by the Bush

administration's failure to ratify the Kyoto Protocol in 2001. But developing countries can only ignore environmental issues that are perceived as inimical to their development if they can generate their resources for development internally.

One stakeholder advised NGOs to look at individual large dams and assess what management programmes were appropriate to minimise the environmental and social impacts because "there are no hard and fast rules on how things should be done". But another stakeholder noted that "if an NGO is anti-dam, no matter how you involve them, they will still be anti-dam because every NGO has its own agenda and can decide what to do in pursuit of that agenda. This means that the use of lack of participation to oppose the BHP and other large dams is just an excuse to undermine the socio-economic development of Ghana and other African countries".

The perception that some western countries and NGOs seek to subvert Ghana's development because of their opposition to the BHP is captured in the statement made by Lewis (1992) that the "environmentalism challenge must be more than to criticise society and imagine a blissful alternative". Thus, for NGOs to reorder their activities they should be "working with, and not against, society at large to devise realistic plans and concrete strategies for avoiding an ecological collapse and reconstructing an ecologically sustainable economic order" (ibid). By "carefully guiding the path of technological progress" (Lewis, 1992), in the case of large dams and their alternatives, the environmental community can decide with the larger society "which alternatives offer the best hope for ecological salvation" (Lewis, 1992). This implies that NGOs and western countries should work to minimise and ultimately remove the perception of some stakeholders that their opposition to the BHP and large dams, in general, for a plethora of reasons is not based on sound judgement, but is an attempt to subvert the development of Ghana and other southern countries.

## CONCLUSION

It can be deduced from this paper that in spite of some environmental, social, and economic concerns, especially those affecting upstream and downstream ecosystems and local people livelihoods, the existing Akosombo dam is well perceived by Ghanaians for its contribution to national development. There is some consensus that without the Akosombo dam the country might be economically, socially, and perhaps politically worse off than it is today. This positive perception has encouraged the current construction of the BHP, based on an assessment of technical, economic, political, and social conditions. In addition, there is scepticism among local people and other actors about the alternatives promoted in the context of electricity generation and Ghana's development ambitions. Thus, the impression is that the attitude of some western-based NGOs, organisations and countries towards large dams seems to subvert the socio-economic development of Ghana because they undermine the construction of the BHP.

However, it is important that problems associated with large dams like Akosombo and its impacts on the livelihoods of resettled and downstream communities are consciously dealt with in the BHP area. For instance, the unavailability of electricity for resettled communities of the Akosombo dam for nearly 40 years after its construction due to the lack of post-dam construction programmes for the resettlements should not be repeated in the BHP. In this regard, it is imperative to internalise the cost of such programmes into the BHP budget and implementation and also to make resettlements part of the social responsibility of the authority operating the dam. To ensure the effectiveness of post-dam construction programmes, people affected by the dam, members of civil society, and the authority operating the dam could set up an independent monitoring group outside the ambit of central government to report on and evaluate the implementation process and effectiveness of the programmes.

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