“Strategies Application in Project Evaluation - The Case of Bumbuna Hydroelectric Project (BHP), Sierra Leone”

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SECTION 4 | Practitioner's Corner

Strategies Application in Project Evaluation – The Case of Bumbuna Hydroelectric Project (BHP), Sierra Leone[1]

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Abstract

This paper discusses environmental sustainability vis-à-vis regulatory compliance and environmental policy issues as related to the challenges and benefits being experienced by the Bumbuna Hydroelectric Project (BHP) in Sierra Leone. The paper's goal is to present strategies by applying established theoretical concepts and frameworks to the BHP case. It examines some critical success factors that could be integrated into best practice management, especially in the face of future environmental and socio-economic challenges. It shows that BHPs' critical success factors depend on the project's peculiar historic and organizational context. The assumption is that achieving environmental compliance in view of responding to public expectations, and recognizing business opportunities, are critical success factors for BHP.

The paper focuses on the Environmental Mitigation and Area Development (EMAD) component of the project as opposed to project contracts and technical assistance. The authors believe that the EMAD component has a direct influence on the livelihood of the people, and as such, it could be used to gain further insights into BHP. If effectively implemented, the EMAD component may become one of the most significant strategic management initiatives taken by BHP in complying with environmental regulations, in reaping potential benefits, and in putting the project in a better position for future financial assistance. As such, this paper's main focus is on activities related to EMAD and recommends the adoption of a competitive strategy like a focused low-cost strategy that will provide the project with a strategic advantage whilst capitalizing on the World Bank's Dam Planning/Management Action Plan (DAMAP).

Key words: Bumbuna Hydroelectric Project, Critical Success Factors, Environmental Sustainability, Sierra Leone, Strategies.
JEL classification: Q40, M10.

Introduction

The Bumbuna hydroelectric dam in Sierra Leone, a creation of the Bumbuna Hydroelectric Project (BHP), is found in the valleys of the Sula Mountains on the river Seli. The main objective of BHP, which was initiated in 1970, was to provide affordable and sustainable electricity supply within the country, especially the capital city of Freetown. This objective is in consonance with that of the New Partnership for Africa's Development (NEPAD) which aims at the integration of Africa into the global energy economy and the reduction of poverty. However, for the past thirty-six years, BHP has still not achieved its objective, as the dam has yet to be operational. The delay in project completion has mainly been due to inadequate finances, environmental constraints, and a civil war (1991-2001) in the country.

The project's initial plan was financed by the United Nations Development Program (UNDP). In 1984, after the completion of a feasibility study, the World Bank decided to invest in the project on the basis of its Dam Planning and Management Action Plan (DAMAP). Within the project's

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chequered history, the government of Italy also made substantial investment, and in 1993, the African Development Bank (ADB) joined forces with the other partners in view of providing funds to BHP. Other major international stakeholders include Salini Costruttori (Salcost), ABB Italia, and Studio Pietrangeli.

Currently, the country's unreliable electricity supply, thermal in nature, is provided by the government-subsidized National Power Authority (NPA) upon which BHP is dependent. In effect, in order for BHP to succeed, NPA, like the Government of Sierra Leone (GoSL), will not only have to provide a clear sense of direction but also be more proactive in determining demand and supply features of sources of energy.

According to the World Bank (WB) report no. 31844-SL (2005), BHP is divided into three components, namely, Hydropower Project Contracts, Environmental Mitigation/Area Development (EMAD), and the Technical Assistance component. Although there would not have been the EMAD component without project contracts and technical assistance, yet the EMAD component is of great significance as related to environmental sustainability vis-à-vis regulatory compliance and environmental policy issues. EMAD dealt mainly with the effects of BHP on the environment, the economy, and society. It comprises of community development initiatives and issues relating to land acquisition, compensation and rehabilitation.

1. Environmental Sustainability

BHP's EMAD component, an overall Environmental Management and Mitigation Plan (EMP), is the major environmental sustainability initiative to be funded by the World Bank. It ranges from land and soil management to agricultural development and fisheries management programs. Also, it is partly in the form of a trust fund, a community development initiative or safeguard measures revolving around capacity building and benefit sharing. Its sources of finance will come from sales of electricity, and from funds provided to developing countries by the Organisation for Economic Co-operation and Development (OECD) through its carbon finance program.

The EMAD component was established in response to the global demand for project-based greenhouse gas emission (GHG) reductions in the energy sector as related to the rationale for environmental regulation. The initiative is an embodiment of innovative management practices based on environmental performance measures. It also serves to monitor social responsibility whilst capitalizing on business opportunities within the framework of the Kyoto Protocol's Clean Development Mechanism (CDM).

Piasecki et al. (1999), pointed out that environmental performance measures are not only evaluative in nature, but they are also goals based on cost quantification and activity driver identification wherein environmental activities are divided into the following five cost pools:

- Strategic/tactical positioning
- Business risk management
- Program administration
- Impact minimization
- Penalty and injury

By using these cost pools, an attempt is made in this section to evaluate the environmental sustainability of BHP's Environmental Mitigation/Area Development component.

Strategic positioning

Strategic positioning as a cost pool could be seen in the recommendation made in a study done by Cemmats Group Ltd. (2004) which called for the need to enforce a government or non-government intervention policy in view of dealing with the environmental impacts of BHP. The study was sponsored by the United Nations Economic Commission for Africa (UNECA), on behalf of the GoSL, and it came up with a strategic energy policy for the country. It called for government in-

tervention in enforcing regulations so that fair play and consumer protectionism could be maintained and private investments and competition could be encouraged.

The study is convincing in portraying strategic positioning as a cost pool wherein strategic policy statements are stated for implementation. However, although short- and medium-term policy priority actions are mentioned, yet the study's Action Plan is not detailed enough to state specific actions to be taken in the long-term. Overall, it provides an understanding of the necessity to achieve environmental compliance through the enforcement of regulations in the hydropower sector of Sierra Leone. Moreover, it encourages the GoSL to reaffirm its strategic commitment of addressing environmental issues and leads to the 2005 World Bank pledge to fund an Environmental Management and Mitigation Plan (EMP) for Bumbuna Hydro within the framework of the Bank's-managed Public/Private Infrastructure Advisory Facility (PPIAF).

Business risk management

Business risk management as a cost pool is considered by BHP as partnership and contractual arrangements. The BHP became a private public partnership in 2003 with participatory bodies as the World Bank (WB), the International Development Association (IDA), the African Development Bank (AfDB), the Government of Italy (GOI), and the Oil Producing Exporting Countries (OPEC) Fund. The project appraisal document of WB, report no. 31844-SL (2005) states that about 64% of the business risk will be borne by the public sector, mainly the GoSL, and 36% by the private sector.

Under an operations and maintenance agreement, the BHP will be incorporated as the Bumbuna Hydro Company (BHC) with the Italian firm, Salcost, holding 95% of its shares and the GoSL 5%. For instance, while the hydropower project contracts will cost foreign investors US$58.401 million, it will cost the GoSL US$8.192 million. In effect, the GoSL planned to pay this cost through BHC on a concessionary basis in a power purchase agreement (PPA) with the National Power Authority (NPA). Furthermore, it is expected that BHC will bear other business risks such as that of interest rate, political insecurity, and that of payment default.

According to the WB Report no. 31844-SL (2005), total project costs for BHP's Environmental Mitigation Area Development component is estimated at US$7.693 million to local investors and US$0.603 million to foreign investors. This indicates that much more effort will be needed from the public sector, especially the government in terms of good governance and security. It also points to the fact that the government should not only rely on debt cancellations and donations from other countries, but to provide its people a sense of direction through wise leadership.

Program administration

In terms of identifying program administration as a cost pool for evaluating the cost effectiveness of BHP's EMAD component, it is observed that a Cabinet Sub-Committee serves as a policy-making body. It consists of the nation's vice-president and five other ministers, notably those for finance, energy and power, and works. The others are lands, and local government.

Under the Technical Assistance component, there is a technical committee which provides general project coordination and supervises the Program Implementation Unit (PIU). The committee consists of a chief environmental officer, a member of the Professional Engineers Association, other professional heads, and government ministerial secretaries. The PIU not only supervises the Wrap up Agreement with Salcost, but also serves as a communication link between both local and international stakeholders.

Impact minimization

Impact minimization as a cost pool for evaluating cost effectiveness of BHP'S EMAD is seen in the report prepared by Azimut Consultants (2005) for the government of Sierra Leone, in terms of satisfying donors, and addressing public expectations. A descriptive methodology is used to compare the legislations on involuntary resettlement in Sierra Leone and that of those found in the World Bank's Operation Manual OP 4.12 (2001). The Azimut report makes mention of two ap-

proaches in relation to resolving the issue of resettlement. The first approach is to disallow any land use within a 30-metre wide right-of-way (ROW) of the electrical transmission line. The second approach, which is chosen, is to reduce the ROW to 7 metres thereby minimizing resettlements of people and making it more cost effective for the project.

The Azimuth Consultants report (2005) convincingly addresses valuation methods for compensation. A clear perspective is presented for calculated values of land, land improvement, and building construction. The least convincing though is the future implementation of the Resettlement Action Plan (RAP). The report provides tools, in the form of valuation methods, to achieve its objective of providing a fair and equitable resettlement and compensation package to BHP affected people. This does not mean that the objective is already achieved. It is entirely up to the implementation unit of the project to execute the necessary recommendations of the RAP. Overall, the report contributes to the general understanding of emerging environmental and social issues in the hydropower business in Sierra Leone.

Penalties and injury

Penalties and injury to human health and the environment as a cost pool is addressed by BHP by putting structures in place that will adequately compensate project affected people. According to the WB Report no. 31844-SL (2005), the Stabilized Agriculture Program, and the Livelihood Assessment and Income Restoration Program are two social initiatives that will make sure that farmers are provided with the necessary technical assistance and that their incomes are restored appropriately. It is hoped that part of the activities of the EMP will be to monitor public health within the project affected area for minimizing the spread of water-borne diseases such as malaria and bilharzias. Generally, BHP's technical committee will be responsible for compensation of project affected people, communications, and watershed and wildlife management issues.

Another area in which penalties may arise is in the case of default by the National Power Authority (NPA) in terms of making timely Power Purchase Agreement (PPA) payments. Although measures are being taken to prevent default, yet it is seen that unpaid and overdue payments will jeopardize the operations of BHP. A great deal of preventive measures is being taken by BHP to address potential risks of the project to human health and the environment in an attempt to mitigate penalties and injury. For example, it is expected that the endangered chimpanzee population will be protected, and an Emergency Preparedness Plan (EPP) will be put in place in terms of a warning and protection system for people downstream in case of emergency.

In conclusion, it could be said that by using the above-stated cost pools or environmental performance measures mentioned by Piasecki et al. (1999), it is found that BHP's Environmental Mitigation/Area Development program has made significant strife to address the issue of environmental sustainability.

2. Challenges and Benefits

The debates on the long-term sustainability of hydropower projects are becoming increasingly more significant, especially with regard to the challenges and benefits for developing countries like Sierra Leone. Albeit the tremendous socio-economic benefits envisaged from BHP, the sustainability of the project is apparently plagued with a plethora of environmental and socio-economic challenges that might have more adverse effects on the country. These challenges are not only linked to the nature of the project and the disruption of the environment, but also to the displacement, compensation/rehabilitation of project affected people, and the difficulty in acquiring funds for project completion. This is mainly due to the inadequacy or lack of necessary resources, skills, and infrastructures to sustain the hydropower project. In effect, the maximum benefits of the project might not be realized.

In terms of environmental degradation, compensation/rehabilitation, conflicts with some local communities are not uncommon. The construction of the BHP dam diverts the flow of the river Seli from its natural course thereby disrupting surrounding ecosystems. This effect is felt upstream

and downstream of the river system by both flora and fauna. While ecosystems upstream are flooded with water, those downstream are deprived of an essential for livelihood. Dams as the BHP are known to change water quality in terms of increase in river water temperature and dissolved gases. Such a phenomenon could negatively affect aquatic habitats, ecosystems, and human communities. In particular, fish migration is disrupted by the slow-flowing dam water and hydropower turbines. It might result in the decline of fish population and food shortage for humans. Similarly, there is a high possibility for the BHP dam to accumulate contaminated sediments which affect fish spawning and deprive downstream ecosystems from receiving sediments.

Moreover, the country's post-civil war environment is not conducive enough to attract private investments thereby failing to fill the gap left by dwindling public sources of finance. The short-term financially uncompetitive nature of the project is not only a challenge in accessing long-term finance, but also in bringing about delay in donor remittances. Under normal circumstance, the cash flow of the project is expected to be a source of revenue. The Bumbuna Hydropower Company (BHC) and the NPA will set tariffs in favour of BHC as a risk mitigation measure. Proper management of debts and expenditures will be based on priorities such as operating/maintenance expenses and debt owed to the IDA. In this case, a potential challenge might be NPA's inability to comply with the Power Purchase Agreement (PPA), thereby threatening cessation of an operation that has taken three decades to start. As such, it could be seen that most of the challenges faced by BHP are not only dichotomous in nature vis-à-vis addressing public and private expectations, but also financing the cost of the project in terms of equity and commercial loans. Finally, the high construction risk and time, the lack of an effective regulatory framework and bad media exposure are also compounding the challenges of the capital and local cost-intensive ($/kilowatt) BHP.

Even though the challenges of BHP are seemingly formidable, yet the benefits from the project for Sierra Leone are promising. Among these are the facts that a well-proven and simple technology is going to be used to provide electricity supply to a country that has been deprived for ages of a reliable source of energy. This means that an increased impetus would be added to agriculture, trade and industry thereby creating and improving secondary economic opportunities like youth capacity-building, tourism, culture and sports. With anticipated carbon finance benefits associated with its greenhouse gas (GHG) emissions reduction, its low operating/maintenance (O&M) costs, and its long project life years, the BHP is in a position to strengthen its link to Sierra Leone's development vision for 2025 and its participation in regional development programs of the Economic Commission of West African States (ECOWAS) and the New Partnership for Africa's Development (NEPAD).

According to the study conducted by CEMMATS Group Ltd. (2004), sponsored by the United Nations Economic Commission for Africa (UNECA), the goal of Sierra Leone's energy policy is not only to produce and use energy efficiently but also to add value to sustainable social and economic development. It is hoped that this will help reduce poverty as reflected in the objectives of NEPAD (2006), and the Millennium Development Goals (MDGs).

In the newspaper Awareness Times of April 28, 2006, a BHP consultant was quoted as saying that the project will need US$93.8 million for final completion. In comparison with the 2005 financing plan of estimated project cost (see Table 1) it is crystal clear that the possibility of an increase in cost could not be unfounded. In this case, there has been a change in the amount of project cost; an increase in cost of US$2 million between 2005 and 2006.

In terms of debt servicing and the time value of money, otherwise known as discounting, it could be calculated that if US$91.8 million were borrowed to finance BHP, and if for example the investors require a rate of return of 10 percent per year, then the project should be generating US$9.18 million yearly in order to repay the debt.

Therefore, as emphasized by WB report no. 31844-SL (2005), it is only feasible to raise funds for BHP by including the debt service reserve in the project's economic analysis, wherein the principle of subtraction is applied on costs of financing (see Table 2). Most of these economic costs include total costs to complete hydropower and transmission structures, operations and maintenance

costs (O&M), environmental and development costs, and costs emanating from technical assistance (see Appendix 1). In effect, the economic benefits are mainly revenues from sale of electricity, and carbon credits.

Table 1

BHP Financing Plan / Estimated Project Cost

Financier	Million USD
Government of Sierra Leone	8.9
International Development Association	12.5
African Development Bank	3.8
Government of Italy	19.9
Netherlands Clean Development Facility	0.3
OPEC Development Fund	8.4
Commercial Bank/IDA Guarantee	38.0
Total	91.8

Table 2

Economic Analysis – BHP (in US$ million, NPV @10%)

	Base Case (Pre-civil war costs are sunk)	Including pre-civil war costs
Benefits	517	517
Investment costs	83	283
O&M costs	79	79
Net benefits	355	155
EIRR (in %)	41	15

Note: A discount rate of 10% is assumed to calculate the present values for the economic analysis. Figures may not add up due to rounding margins. WB 2004 projections for crude oil prices were used for the analysis. [Source: Adapted from WB report no. 31844-SL, p. 102.]

From the ongoing analysis, it could be observed that the project costs of Bumbuna Hydro are significantly influenced by the concept of innovation and change. For example, innovation in the sense of developmental integration, financing trends, and the use of contemporary management accounting and corporate finance practices as proposed by WB, and change in view of the volatile nature of the hydropower industry, and organizational culture.

Davidson (2006) considered poor access to electricity as a major challenge for West Africa, suggesting the need to integrate both urban and rural electricity development programs within the context of the West African Power Pool (WAPP). This is especially true for a war-torn country like Sierra Leone where poverty reigns and the challenge is the lack of "affordability" by the people to purchase electricity when available.

Head (2000) made mention of the current trends in private financing based on the drive for run-of-river projects and avoidance of large dams that tend to be costly, plagued by lengthy construction time, and poor publicity. The second major trend in private financing is that towards smaller hydropower projects like BHP (50MW). This trend arises in view of mitigating the effects of environmental degradation caused by larger projects, although according to the author it might not be a best practice.

As stated earlier the report prepared by Azimut Consultants (2005) for the government of Sierra Leone is in response to a World Bank requirement related to involuntary resettlement and the corporate responsibility of BHP for providing a fair and equitable resettlement and compensation package. The challenge is to develop and use a cost-effective and an appropriate valuation method

for compensation of project affected people. From the perspective of best management practices, a solution might be to perpetually maintain a balance between the interrelated challenges and benefits. It is a question of aligning the ideals of a project with the dynamics of sustainable development. It entails a series of changes like policy reforms, energy production, distribution and consumption, reflecting the shift towards the era of the sustainable energy economy.

In a nutshell, the environmental and socio-economic challenges and benefits of BHP to project affected people (PAP) and the industry are based on its long-term sustainability. For example, the restoration of the livelihood of PAP through youth capacity building, benefit sharing, and compliance to the power purchase agreement (PPA). In the case of BHP, achieving environmental compliance and competitive advantage are largely dependent on maintaining a balance between corporate environmental initiatives and business needs. In effect, BHP is forced to be socially responsible and environmentally accountable if it is to survive in today's competitive corporate world.

Further exploration of the challenges and potential for project affected people and the hydropower industry is presented through the construction of an External Factor Evaluation (EFE) Matrix that permits summarization and evaluation of economic, social, cultural, demographic, environmental, political, governmental, legal, technological, and competitive information. Also, by constructing an Internal Factor Evaluation Matrix (IFE), the strengths and weaknesses of a firm could be evaluated (David, 2001).

In Table 3, (EFE Matrix), the weight indicates the relative importance of that factor to success in BHP's industry. The ratings (ranging from 1 to 4 where 1 is a poor response and 4 is a superior response) reflect on the effectiveness of the strategies of BHP. In this case, a total weighted score of 3.00 indicates that BHP is seemingly responding well to current opportunities and threats in its industry, as the average total weighted score is 2.5 for an EFE Matrix. Similarly, in Table 4 (IFE Matrix), the weight indicates the relative importance of the factor to being successful in the firm's industry. The ratings range from 1 to 4 where 1 is a major weakness, 2 is a minor weakness, 3 is a minor strength, and 4 is a major strength. With a total weighted score of 2.5, which is the average score for an IFE Matrix, the indication is that BHP is having a relatively strong internal position and that BHPs' strategies, according to the EFE Matrix, are taking advantage of opportunities and militating against the effects of external threats, if not effectively.

Table 3

Industry Analysis: External Factor Evaluation (EFE) Matrix for BHP

Key external factors	Weight	Rating	Weighted score
Opportunities			
1. Participation in national/regional economic/political development (e.g. ECOWAS, NEPAD)	.10	4	.40
2. Well proven/simple technology	.15	4	.60
3. Dependency on fuel prices	.10	3	.30
4. Attraction of secondary activities (e.g. culture, tourism, youth capacity-building, sports)	.10	3	.30
5. Participation in GHG emission reduction campaign	.10	3	.30
Threats			
1. Conflicts with local communities (e.g. compensation/environmental degradation	.10	3	.30
2. Post-civil war environment	.10	3	.30
3. Dwindling public sources of finance	.15	2	.30
4. Lack of effective regulatory framework	.05	2	.10
5. Bad media exposure	.05	2	.10
TOTAL	1.00		3.00

Note: Ratings for Tables 3 and 4 are intuitive based on research done by the authors.

Table 4

An Internal Factor Evaluation (IFE) Matrix for BHP

KEY INTERNAL FACTORS	WEIGHT	RATING	WEIGHTED SCORE
Strengths			
1. Application of WB's Dam Planning/Management Action Plan (DAMAP)	.05	4	.20
2. Financial/technical assistance from GOSL, WB, IDA, AfDB/Salcost	.05	4	.20
3. More than 50% of project completed	.05	4	.20
4. Use of contractual arrangements/PRG	.05	4	.20
5. Small-size capacity project – 50MW	.05	4	.20
6. High public moral support	.05	3	.15
7. Low operating/maintenance (O&M) cost	.05	4	.20
8. More project life years	.05	3	.15
9. BHP's link to Sierra Leone's development vision for 2025	.05	3	.15
10. Benefits from carbon finance – GHG emission reduction	.05	3	.15
Weaknesses			
1. Capital/local cost-intensive ($/kilowatt)	.10	1	.10
2. High site-specific nature	.05	1	.05
3. High construction risk/time	.05	1	.05
4. Possibility of regulatory/conservatory policy mismanagement	.05	2	.10
5. Likelihood of delayed donor remittances	.10	2	.20
6. Financially uncompetitive on short-term basis	.05	2	.10
7. Difficulty in accessing long-term finance	.10	1	.10
TOTAL	1.00		2.50

Note: Ratings for Tables 3 and 4 are intuitive based on research done by the authors.

Today, hydropower-producing companies, researchers, and other key players are becoming more concerned with the long-term sustainability of the hydropower business, especially where companies could combine sustainable practices with profit-making. In such cases, alternative intervention strategies are needed to address each situation in its own context.

3. Towards Alternative Intervention Strategies

The paper's goal is to present strategies by applying established theoretical concepts and frameworks to the BHP situation thereby helping to move the project from three decades in the doldrums. In view of formulating strategies to achieve goals, Porter's (1985) competitive strategies model described three types of strategies that could be used. These are termed differentiation, low-cost leadership, and focus. If BHP is to use Porter's model to select strategies, evaluation could be done on the basis of competitive advantage by offering lower cost of power supply, and competitive scope by competing on a broad scope or narrow scope.

If a differentiation strategy is to be used, BHP could distinguish itself through the provision of exceptional services to consumers, like the provision of cheap and reliable supply of electricity. If a low-cost leadership strategy is to be used, BHP could increase market share by offering low cost for its power supply thereby combating competition. On the other hand, if a focused strategy is to be used, BHP could concentrate on a specific group of consumers and at the same time try to achieve either a low cost advantage or a differentiation advantage. However, the most important

issue is to adopt a competitive strategy like a focused low-cost strategy that will provide the project with a strategic advantage.

The TOWS Model

Weihrich (1982) developed the TOWS Matrix as a matching tool for selecting four types of strategies, namely: Strengths/Opportunities (SO) Strategies, Weaknesses/ Opportunities (WO) Strategies, Strengths/Threats (ST) Strategies, and Weaknesses/ Threats (WT) Strategies.

In this section, an attempt is made to match the main internal and external factors of BHP (as elaborated in Tables 3 & 4) with a view to formulating strategies that might help the project to raise funds for completion (see Table 5).

SO Strategies could use the internal strengths of BHP to capitalize on external opportunities. For instance, BHP could continue to apply WB's DAMAP thereby taking advantage of national and regional economic and political development initiatives sponsored by such organizations as the Economic Commission of West African States (ECOWAS), and the New Partnership for Africa's Development (NEPAD). In order to apply SO Strategies, BHP could pursue WO, ST, or WT Strategies in view of overcoming its major weaknesses, avoiding major threats, and concentrating on opportunities. For instance, the project could adopt a focused low-cost competitive strategy or reduce its project overhead.

Similarly, BHP could also use WO Strategies (adopt focused low-cost competitive strategy) to improve its internal weaknesses by taking advantage of external opportunities. With ST Strategies, BHP could use its strengths (continue to apply DAMAP) to avoid or reduce the effects of external threats. Finally, by using WT Strategies (reduce project overhead) which are defensive tactics, BHP could reduce internal weaknesses and avoid environmental threats.

It should be noted that not all of these strategies could be chosen for implementation as the purpose of the TOWS Matrix is to develop alternative strategies rather than to search for the optimum. However, in the case of BHP, one is tempted to suggest as a priority, a focused low-cost strategy that will provide the project with a strategic advantage like its application of World Bank's Dam Planning/Management Action Plan (DAMAP).

As it could be observed, the task of choosing an alternative strategy for BHP, especially in view of seeking finance, is partly dependent on identifying the strengths and weaknesses of the projects' competitors as related to BHP's strategic position. According to David (2001), not only are the strengths and weaknesses important but also the opportunities and threats of a firm in choosing a strategy from a series of critical success factors. In the case of BHP, some of these factors are those found in the above-mentioned matrices as lessons learnt or *sine qua non* for the implementation of a project. Although the critical success factors might vary from one hydropower project to another, yet there are common characteristics, mainly found in the organizational and historic context, that are shared by such projects.

In terms of identifying critical success factors for hydropower projects, Engwall (2002) argued that success depends on a project's historical evolution and organizational context. For example, it could be said that the internal strengths and weaknesses of a project like BHP are greatly influenced by its evolutionary nature and contextual environment. Therefore, the identification of critical success factors needs an ontological type of change wherein the project is conceptualized on the basis of its past trends and current circumstances.

BHP is organized in such a way that lessons learnt elsewhere by the project's major donors, as the World Bank (WB) and the International Development Association (IDA), are being applied in the quest for success. One of the project's greatest strengths is the technical assistance, in the form of management and supervision, being rendered by the Bank not only to the Project Implementation Unit (PIU) but also to the Dam Review Panel of Experts (DRP), the Environmental and Social Advisory Panel of Experts (ESAP), the Resettlement Action Plan (RAP) Implementation Team, and the Communications Action Program.

Furthermore, it is observed that a considerable segment of the project's organizational design is based on the findings and recommendations of the World Bank's Dam Planning and Management Action Plan (DAMAP) which involves such issues as hydropower operations, the Water Resource Sector Strategy, and Partial Risk Guarantee (PRG). For instance, although the BHP was originally planned to generate 305 megawatts (MW) of electricity yet in 1984 it was recommended by feasibility study that 50 MW will be less risky for Sierra Leone vis-à-vis project and country risks in terms of debt repayment.

Similarly, within the recent history of BHP, in 2005, and in terms of critical success factors, it was an achievement for the authorities to have done a retrospective option assessment which allowed them to suggest alternative least-cost designs for the environmental and social management components of the project. The impact assessment and mitigation measures taken in DAMAP will hopefully reduce involuntary resettlement and foster benefit sharing.

The proposed use of contractual arrangements in order to mitigate project and country risks is also a critical success factor especially in the light of the global decline in private financing for new or unfinished projects like BHP. The arrangements are aimed at distributing bank-worthy risks equitably between the public and private sectors. It demands an effective revenue management system by an appointed neutral party in a bid to ensure timely financial obligations. In effect, project and country risks associated with unstable economies and volatile political systems like in BHP's Sierra Leone are covered by World Bank's Partial Risk Guarantee (PRG). Whether the PRG is an effective long-term strategy is debateable as it does not apparently help much in improving the political and economic volatility of the country.

The issue of identifying critical success factors could also be linked to the present value discounted rate of revenues, for example, annuities, and expenses. In the case of BHP, success will depend on its ability to repay the financial borrowers interest and the principal. Earlier studies by Bourassa, (1985) who initiated the James Bay Hydroelectric project in Quebec, Canada, cautioned about the likelihood of project revenue not being in consonance with interest payments, hence the need for present value discounting.

Table 5

A Threats-Opportunities-Weaknesses-Strengths (TOWS) Matrix for BHP

	STRENGTHS – S	**WEAKNESSES – W**
	1. Application of WB's Dam Planning/Management Action Plan (DAMAP) 2. Financial/technical assistance from GOSL, WB, IDA, AfDB/Salcost 3. More than 50% of project completed 4. Use of contractual arrangements/PRG 5. Small-size capacity project – 50MW 6. High public moral support 7. Low operating/maintenance (O&M) cost 8. More project life years 9. BHP's link to Sierra Leone's development vision for 2025 10. Benefits from carbon finance – GHG emission reduction	1. Capital/local cost-intensive ($/kilowatt) 2. High site-specific nature 3. High construction risk/time 4. Possibility of regulatory/conservatory policy mismanagement 5. Likelihood of delayed donor remittances 6. Financially uncompetitive on short-term basis 7. Difficulty in accessing long-term finance

Table 5 (continuous)

OPPORTUNITIES – O 1. Participation in national/regional economic/political development (e.g. ECOWAS, NEPAD) 2. Well proven/simple technology 3. Less dependent on fuel prices 4. Attraction of secondary activities (e.g. culture, tourism, youth capacity-building, sports) 5. Participation in GHG emission reduction campaign	**SO STRATEGIES** 1. Pursue fund-raising campaign (S1, O1,O5)	**WO STRATEGIES** 1. Adopt focused low-cost competitive strategy (O2, O3, O4, W1, W5, W6, W7)
THREATS – T 1. Conflicts with local communities (e.g. compensation/environmental degradation 2. Post-civil war environment 3. Dwindling public sources of finance 4. Lack of effective regulatory framework 5. Bad media exposure	**ST STRATEGIES** 1. Continue to apply DAMAP (S1,S2, S3, S4, S5, S6, S7, S10, T1, T2, T3, T4, T5)	**WT STRATEGIES** 1. Reduce project overhead (W1, W5, W6, W7, T3)

In terms of organizational context and success factors, BHP has taken the participatory approach towards the Bumbuna community of locally elected leaders. They have been involved in the project design and implementation, especially in resettlement compensation and feedback mechanisms. In consultation with local leaders and project stakeholders through the Communications Action Plan, BHP is a fervent supporter of sustainable agricultural practices and biodiversity conservation. This could be seen in its watershed management program and the sanctuary created for endangered species as the chimpanzees, as stated in the World Bank Report No. 31844-SL (2005).

Part of the critical success factors at BHP includes formulating and choosing sound alternative strategies. In order for such to be done, we use David's (2001) SWOT analysis in view of identifying and evaluating a company's internal strengths and weaknesses, its external opportunities and threats, its critical success factors as compared to project rivals, and its vision and mission. In the case of BHP, such a competitive advantage is significant in view of its current drive to acquire private financing for completion of the project.

In Table 4, an intuitive attempt is made to construct an Internal Factor Evaluation (IFE) Matrix for BHP. It is a strategy-formulation tool which identifies and evaluates relationships and key strengths and weaknesses of the project. The table indicates that BHP's major strengths are its compliance to the requirements of the World Bank (WB), low operating/maintenance (O&M) costs, and its use of contractual arrangements/PRG as shown by the rating 4. The major weaknesses are its capital/local cost-intensive nature, high site-specific nature, high construction risk/time, and its difficulty in accessing long-term finance. In the final analysis, the total weighted score of 2.50 shows that BHP is within average in its overall internal strength.

The phenomenon of key success factors for BHP is largely dependent on the organizational and historic context of the project. Namely, the application of lessons learnt elsewhere by donors in the form of WB's DAMAP, the proposed use of contractual arrangements, the need for present value discounting in terms of the project's financial viability (rate of return), and the formulation and appropriate choice of alternative strategies.

With reference to the sustainable guidelines created by the International Hydropower Association (IHA) (2004), one could state that the key success factors for hydropower projects like BHP are

based on not only providing affected communities with improved living conditions but also to improve public health, encourage benefit sharing and support other development projects such as education, agriculture, and women empowerment on a nation-wide basis.

The IHA guidelines also linked critical success factors to the appropriate choice of energy options, and hydropower alternatives, in executing the stages of environmental assessment, and in optimising environmental outcomes for hydropower projects like BHP. In conclusion, the guidelines suggested that the sustainability of energy options is relative to the prevailing environmental assessment and regulatory constraints.

In a discussion on innovation and change, Daft (2004) mentioned not only the need to be prepared for change, to accept change, and to commit oneself to change but also to get management support to implement change on a step by step basis, and to encourage participation in the change process. From the ongoing analysis, it could be observed that the project costs of Bumbuna Hydro are significantly influenced by the concept of innovation and change. For example, innovation in the sense of using contemporary management accounting and corporate finance practices as proposed by World Bank, and change in view of the volatile nature of the hydropower industry, and organizational culture.

Projects like BHP may need to identify and adopt changes and/or strategies in order to compete for funding. The competitive nature in accessing such funds involves total commitment by the authorities concerned. According to Ghemawat (1991) this is because making strategic decisions entail investments in so-called "sticky factors" such as physical assets, resources, and capabilities that cannot be freely transferable. In effect, a business like BHP must stay committed to its strategy in view of executing its risky commitment-intensive decisions.

Further discussion on BHP is based on the framework of vision and culture as interpreted by Rampa (2005), and as seen in the above-mentioned Matrices of BHP. An attempt is hereby made to apply this framework to BHP.

Vision/Mission

According to Rampa (2005), a key essential for formulating, implementing, and evaluating strategy is a well-designed vision and mission statement, often referred to as the roots of strategic management. In the case of BHP, the PIU should be able to show the peculiarities of the project, its competitive advantage, and its sense of purpose in such statements that could stand the test of time.

Objectives

The objectives of BHP should be reflected in a business plan based on the SMART approach wherein objectives are expected to be specific, measurable, achievable, realistic, and time-framed.

Strategy

In terms of a strategy for effecting continuous improvement, BHP's PIU should be involved in strategic management to enhance organizational performance in terms of efficiency and effectiveness. It should even be prepared to seek ownership or increased control over NPA (in the case of default) in what is termed a horizontal integration strategy. Furthermore, continuous improvement could be achieved by the following means:

- **SWOT analyses**

SWOT analyses should be done on a regular basis as shown in Tables 3, 4 and 5 in order to see how well BHP is using its overall strength to respond to current opportunities and threats in the hydropower industry. With reference to the TOWS Matrix in Table 5, the following three strategies are recommended:

1. Pursue fund raising campaign with regards to BHP's application of the WB's Dam Planning/Management Action Plan (DAMAP) thereby capitaliz-

ing on opportunities arising from its participation in the regional aspirations of the Economic Commission of West African States (ECOWAS) and New Partnership for Africa's Development (NEPAD), and in GHG emission reduction.

2. Adopt focused low-cost competitive strategy that makes use of the well-proven and simple hydropower technology that is less dependent on fuel prices and attractive to issues like youth capacity-building. This is in view of combating the capital /local cost intensive and financially uncompetitive short-term nature of the project, the likelihood of delayed donor remittances, and the difficulty in accessing long-term finance.
3. Reduce project overhead by using weaknesses as high construction risk/time to overcome threats as conflicts with local communities, and the post-war environment.

- **Business plan**

BHP needs a business plan based on communication, commitment, proper tools and efficient teams. A business plan that aligns human resources with other resources keeping the objectives of BHP in mind.

- **Critical success factors (deliverables)**

BHP's PIU should continuously identify its critical factors as the present value discounted rate of revenues for proper alignment with the project's structure, mainly historical evolution and organizational context.

- **The use of change management and BAU**

BHP should develop its business culture in consonance with its vision, mission, objectives, and strategy. Change should be implemented on an incremental basis while the Business As Usual (BAU) approach is integrated into culture.

- **Using Benchmarks**

The strategy of using benchmarks for effecting continuous improvement in this framework could be used by BHP. These are lessons learnt from other hydropower projects such as the Akosombo dam in Ghana, the Kariba in Zimbabwe, and the Cahora Bassa dam in Mozambique.

- **Pillars of the Business Plan**

The pillars of the business plan for implementation are communications and commitment, tools and teams. They aim at providing the appropriate environment for continuous improvement. The purpose of BHP should be defined, ownership created, and accountability instituted within these pillars.

- ***Communications*** **–** All key stakeholders should be influenced through effective communications. Brainstorming with local village elders, and the current radio programs are encouraging.
- ***Tools*** **–** The use of tools that illustrate the relationship between the challenges and benefits of BHP is another pillar of the business plan and this framework. For example, the use of the EFE Matrix, the IFE Matrix, and the TOWS Matrix.
- ***Teams*** **–** The importance of teamwork is being stressed as a means of boasting collaboration among key stakeholders. BHP could take the initiative of creating a regulatory framework that is accepted by environmental NGOs as the "false dichotomy" between the industry and NGOs is disappearing, Fortin (2002).

- **Commitment**

Commitment to the development and implementation of a Total Quality Management (TQM) business plan should be reflected by the PIU in the policies of BHP.

- **Culture change**

BHP's culture should be consistent with its vision, mission, objectives, and strategy, especially during a period of change when there is a tendency for the existence of symptoms of structural and cultural deficiencies.

In conclusion, it could be stated that the need for feedback in such a framework is inevitable. The framework is to be used on the grounds that key stakeholders should know their strengths and weaknesses in order to work in a collaborative manner. Secondly, BHP should be able to determine its stakeholders' level of influence and affiliation.

4. The Future

The future of BHP not only depends on designing, implementing, monitoring, and evaluating appropriate strategies but also on maintaining a stable political and economic system within the West African region. The BHP will not only need to adopt strategies in view of competing for private funding, but also to continuously evaluate these strategies based on such criteria as consistency and feasibility. Not much good will come out of strategies that are devoid of wise leadership and good governance in an environment of national insecurity. Sierra Leone is still highly traumatised by a brutal civil war that saw one of the largest numbers of peacekeeping force from the United Unions. As a result, in order for BHP to succeed, the government will have to provide a clear sense of direction, combat nepotism, tribalism, and corruption; be less dependent on donors, and be more proactive in determining demand and supply features of sources of energy.

The practice of defining how an organization might reach its goals, and that of obtaining private financing for hydropower projects involve strategic commitments that can not easily be reversible. As such, these commitments and their importance to competition have long-term effects that must be addressed from the initial project planning stage. For instance, the World Bank demands that certain requirements be fulfilled in order to qualify for loans. At BHP, the project has to be restructured, the government has to comply with obligations, auditing arrangements have to be made, and BHP or the government need to enter into concession agreements.

Head (2001) argued that the decline in new hydropower projects is largely a creation of the current trend towards private financing. In this regard, BHP might find it increasing difficulty to raise funds, especially in view of the move from public sector funding to more commercial form of lending. The dependence of BHP financing on the project's size and business nature will continue to be a critical success factor.

Sunman (1999) analyzed statistics from the Development Co-operation Directorate (DAC) showing financial flows of private and official capital for developing countries like Sierra Leone. It indicated the relative shift between official and private flows in the 1990s, and the dwindling private financial flows in the 1980s within approximately twenty years. From Sunman's analysis, it is observed that in the future, BHP might have to be content with official financial flows rather than private.

With regards to contractual arrangements, the Bumbuna Hydropower Company (BHC) will be granted a concession for operating, maintenance, and management of BHP. The risks that are expected to be carried by BHC will include interest rate risk, operational risk, and risk of non-payment by the National Power Authority (NPA). A Power Purchase Agreement (PPA) will be signed between BHC and NPA for the supply of power to NPA. The Government of Sierra Leone (GoSL) will provide funds for the local cost of the project. In addition, the Project Implementation Unit (PIU) will be responsible to manage the main components of BHP. An accounting team will maintain accounting records; prepare quarterly financial reports and statements acceptable to GoSL and WB's disbursement policy and procedures (see Appendix 1: Project Costs).

As related to the future of energy management and the environment at BHP, the research results of this paper are based on the following findings:

- BHP's strategies should take advantage of opportunities and mitigate the effects of external threats, as seen in an External Factor Evaluation (EFE) Matrix for the project (see Table 3). It indicates that BHP is above average in terms of a project's ability to capitalize on opportunities in view of combating threats. Likewise, as seen in an Internal Factor Evaluation (IFE) Matrix (see Table 4), BHP is within average in its overall internal strength as a viable entity.
- That BHP should continue to comply with environmental regulations within a relatively unreformed public sector regulatory framework practising cost quantification by using environmental performance measures as a path to raising funds for project completion.
- That BHP's inability to comply with Power Purchase Agreement (PPA) will manifest itself in the form of unpaid and overdue payments thereby jeopardizing the operations of the project, and discouraging potential long-term loans with low interests.
- It is observed that the project costs of BHP will continue to be influenced by the concept of innovation and change. Also, by using a TOWS Matrix, it was found out that alternative strategies could be developed for BHP rather than searching for the optimum as all are a question of making irreversible strategic commitments.
- That because of the challenges involved in executing best practices, and the lack of national resources, infrastructures, and good governance, BHP might find itself in a better position in terms of effective implementation if it adopts the strategic path recommended in this paper.

5. Concluding Remarks

The research problem was to identify the potential challenges and benefits associated with BHP and to determine sound business strategies that will help bring about the completion of the project.

The findings were that in identifying challenges and benefits and determining strategies, BHP has the overall internal strength to capitalize on external opportunities in view of combating threats. Also, that BHP is faced with alternative strategies, albeit irreversible strategic commitments in the midst of innovation and change, making access to private finance more critical in achieving the goals of the project. Moreover, it was also discovered that because of a possible Power Purchase Agreement-default, and the country risks (poor infrastructures, post-war environment, and improper governance) involved, the project might be ineffective and unviable for long-term private financing. And, because of some or all of these risks and challenges, BHP, at one time or the other, has been denied funding by some private financiers. In effect, these risks and challenges have made executing best practices, completion of BHP, and effective implementation a difficult task.

As a concluding remark, it should be stressed that apart from the WB-related documents on BHP, research information about the project is scanty. Among other issues, the future of energy and the environment is relatively bleak in this part of the world. However, Sierra Leone's population is still hoping to see the completion of BHP in 2007, as promised, even though there is a national presidential election scheduled for that same year. It will be a Herculean task for the country to complete these two national events within the stipulated timeframe without any major political or socio-economic disruption.

This study is limited to an analysis of the dimensions of the problems revolving around the uncompleted BHP in view of finding appropriate strategies for completion. Recommendations for further study may include an application of a set of sustainability guidelines developed by the International Hydropower Association (IHA), (2004) to the case of BHP. A potential objective might be to evaluate BHP on the basis of these guidelines as they aim to promote an awareness of the environmental, social and economic aspects of sustainability assessment in hydropower projects.

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Appendix 1

Sierra Leone: Completion of the Bumbuna Hydroelectric Project – Components Project Cost Summary (including physical and price contingencies)

All figures are in US$ Million

	Local	Foreign	Total Project Cost	IDC	Total Project Cost, incl. IDC	% Foreign Exchange Base	% Total Cost
A. Hydroelectric Project Contracts							
Civil/Hydraulic Steel Structures (Contract A2/B)	7.274	34.011	41.285	3.979	45.264	82%	48%
Electromechanical Equipment (Contract C)	0.479	16.051	16.530	1.301	17.831	97%	19%
Transmission Line/Substation (Contract D)	0.439	8.339	8.778	0.000	8.778	95%	10%
Sub-total	8.192	58.401	66.593	5.280	71.873	88%	77%
B. Environmental Mitigation/Area Development							
Environmental Management	2.806	0.528	3.334	0.000	3.334	16%	4%
Land Acquisition, Compensation/Rehabilitation (Reservoir Area)	3.487	0.000	3.487	0.000	3.487	0%	4%
Land Acquisition, Compensation/Rehabilitation (Transmission Line)	0.175	0.000	0.175	0.000	0.175	0%	0%
Upper Seli Community Development Initiative	1.225	0.075	1.300	0.000	1.300	6%	2%
Sub-total	7.693	0.603	8.296	0.000	8.296	7%	10%
C. Technical Assistance							
Construction Supervision for HEP Contracts	0.107	3.515	3.622	0.000	3.622	97%	4%
Support for the Bumbuna PIU	0.600	1.210	1.810	0.000	1.810	67%	2%
Dam Safety Panel of Experts	0.000	0.110	0.110	0.000	0.110	100%	0%
Environment/Social Advisory Panel of Experts	0.000	0.696	0.696	0.000	0.696	100%	1%
Communications Action Plan	0.147	0.017	0.164	0.000	0.164	10%	0%
Project Management/ Supervision – Component B	2.085	1.129	3.214	0.000	3.214	35%	4%
Sub-total	2.939	6.677	9.616	0.000	9.616	69%	11%
Total Baseline Costs	18.824	65.681	84.505	5.280	89.785	78%	98%
Repayment of PPF	0.000	2.000	2.000	0.000	2.000	100%	2%
Total Project Cost	18.824	67.681	86.505	5.280	91.785	78%	100%

Source: Adapted from WB report no. 31844-SL, Annex 5.