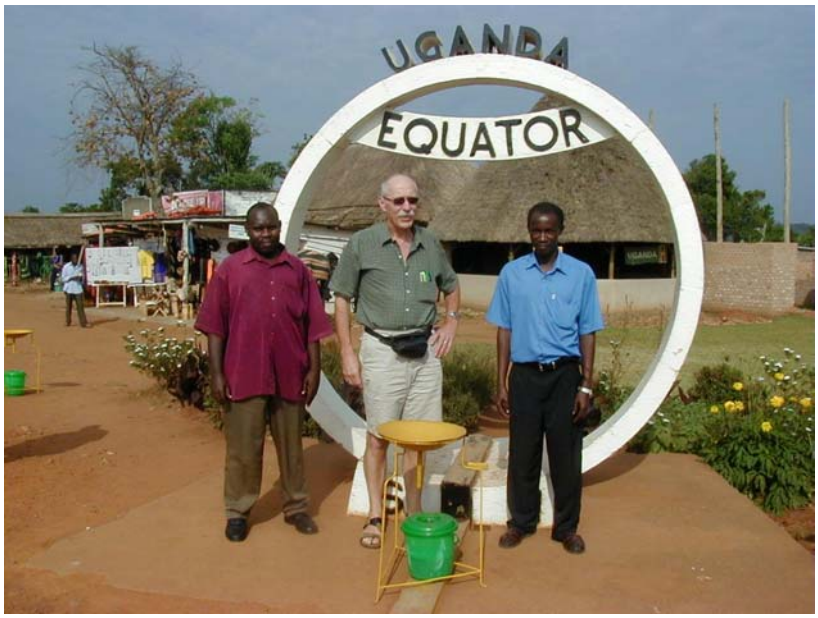

DAMMING RIVERS- COSTS AND BENEFITS

A CASE STUDY OF THE PROPOSED BUJAGALI POWER DAM IN UGANDA

Introduction
Damming rivers in Uganda
Examples and costs involved
Benefits

- social
- economic
- environmental

Concerns related to damming
Recommendations and Way forward

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Abuiin Juliet – Environmental Officer
Rural Development Media Communications (RUDMEC)
P.O Box 1727 Kampala – Uganda
Tel: +256-41-230678
Mobile: +256-77-654604
Email: julietabuiin@yahoo.com

Executive Summary

Projects for building dams and their associate reservoirs are usually planned for one or more of the following: hydroelectric power generation, irrigation, domestic and industrial water supply.

However, the history of large dams in the tropics has many environmental horror stories. For instance, many experts believe that nothing is more destructive of riverine and riparian species like a dam. It traps sediment and nutrients, alters a river's temperature and chemistry and upsets the geological processes of erosion and deposition that sculpt the surrounding land, so that its overall impact will almost certainly be to reduce species diversity.

Decisions to build dams are therefore now being contested increasingly as human knowledge and experience expand, as we develop new technologies, as decision-making becomes more open, inclusive and transparent.

For Uganda's case, Bujagali Power Dam proposed to be constructed by the Government of Uganda on River Nile 8 Km down stream of Kiira hydroelectric dam has been surrounded by controversies since 1994. The cost of the project (US$ 530 million) is, to be funded by the Government of Uganda. World Bank, Environmentalists, and civil society have been concerned about bribery/corruption, over pricing, lack of a proper environmental impact assessment, the EIA studies for Bujagali project are not complete making it difficult to adequately understand the project and also do not present any clear information related to alternative options for generation. Also no proper economic evaluation of costs, benefit only of exporting power for example to Kenya are presented. And ineffective technical design given the already evident technical error caused by Kiira Dam extension, which has led to 2-metre drop in Lake Victoria water level. Indeed Uganda desperately needs a dam to address the current power deficit of 120 Megawatts, which grows at 24mw annually.

The benefits of this proposed dam include generation of 250 MW, which could save the country 2 percent of the GDP, US$ 38.6 million lost annually due to energy crisis, employment of about 9,000 local people during the construction phase, increase in water habitat.

The costs include the destruction of the only international water rafting tourist attraction site visited by over 7,000 tourists annually, loss of biological diversity and, displacement of 1,522 individuals.

Despite unresolved controversies, the government of Uganda has ignored the concerns of stakeholders particularly the environmentalists and decided to build the dam come 2006.

Introduction

In 1986, Uganda was emerging from 15 years of misrule. A new regime under the leadership of President Yoweri Museveni had demonstrated a clear commitment to economic reform and was actively encouraging private sector investment in the country. At that time, the Owen Falls power station (the only one in the country) with an installed capacity of 150 MW was producing 60 MW. The power plant was however refurbished and upgraded to 180 MW in the late 1980's. By 1994 as a result of rapid economic growth, the maximum demand for electricity was about 220 MW, but the Uganda Electricity Board was unable to meet demand and the load shading of 40 MW at peak times.
The development process for the Bujagali Hydropower project thus began at that time when the government of Uganda began discussions with AES with a view to a private sector investment to construct and operate the 250 MW scheme located on river Nile some 8 km downstream of the Nalubale and Kiira hydroelectric power projects (formally named Owen Falls and Owen Falls extension).
Since 1994, peak demends for electricity has increased to 350 MW in 2004. However, despite the commissioning of 120 MW of additional capacity at Kiira hydro power station, load shading of 75 MW is currently being implemented on a rota basis and commissioning of the Bujagali power station is as far away as ever.
The demand for power as a result of new consumers has continued to grow at 24MW per year, without substantial new generation capacity. Only 6% of Ugandans population have access to electricity and 80% use wood fuel.
Indeed the country desperately needs another dam to address pending power deficit, but controversies, bribery, over pricing and refusal to take up alternative sites where environmental impacts are less significant must be observed by the Government.
With support from both international environmentalists, civil society, the government of Uganda can be encouraged to address all the above concerns.

2.0 Benefits of damming rivers

This paper categorises benefits of damming rivers as economic, social and environmental related. Using Uganda and proposed Bujagali Dam project as case study.
There are many pros and cons to dam construction. By installing dams over rivers the water flow can be controlled in such a way that supply of water is constant however dams can have drastic effects on aquatic fauna as downstream populations of animals are used to a certain flow of water and a dam disrupts this.
The environmental impacts of dams can be severe. In some areas of the world there are plans to start dismantling dams and return natural flow levels, natural navigation and migration routes.

2.1 Economic benefits

Investment both local and foreign.

A series of studies conducted by Ministry of Finance and economic planning 1989, World Bank and Private sector Foundation (1994 and 1998) identified inadequate electricity supply as a major constraint to private investments and to the development objective of the country. The constraints were related to price, quality and availability of electricity. In all those surveys electricity related constraints ranked first obstacle to development.
The World Bank/ PSF survey further revealed that on average firms find themselves without power 91 days per year due to load shading. Also as many as 42 percent of the firms surveyed are forced to supplement with diesel generators. In Uganda on average, a generator costs 52.8 million shillings (approximately

US$31,000) to operate annually.
This partly explains why Uganda continues to produce at a high cost production location.

In 1998 power shortages was estimated to be creating a loss equivalent to 2 percent of the gross domestic product annually. And by 2004, estimate loss in GDP was US$ 9million.

Foreign exchange earnings

Uganda is endowered with vast hydroelectric resources estimated at 2,000MW. Unfortunately, less than 10 percent of this capacity has been exploited to date. Because of the low-level exploitation, the country operates under a power deficit regime that was addressed above. This unfortunate situation is further compounded by the fact that Uganda cannot currently fully meet its electricity export contracts and therefore incures losses in foreign exchange revenue. Bacon (1996) estimated annual losses due to unrealised export revenues at average level of US$ 38.5 million over the period 2004-2007.
The loss will impact negatively on the country's balance of payments. The failure to build another dam by 2004 has made Uganda unable to meet the terms of additional export agreement. With Kenya, which now gets power only at night during off peak hours.
Constrained growth from the business sector , either not investment or not operating at full capacity will translate directly into lower fiscal revenue .Bacon (1996) estimate that loss of Bujagali project would have an irrecoverable tax cost of US $ 7.0m in 2004 ,increasing to US $ 40 million in 2007. This irrecoverable tax loss will be compounded by the loss of GDP growth increases over time.

2.2 Social benefits

Implementation of the Bujagali Project will lead to socio-economic development and that the quality of life of the majority of Ugandans is enhanced as a consequence. Electrification of rural areas and even opening up of this area with roads, hotels, health units and thus many more indirect employment opportunities throughout the country resulting from a freely growing economy.

2.3 Environmental related benefits

Building dam would discourage deforestation by providing an alternative energy to wood fuel and charcoal burning which is the principle source of fuel in Uganda. It may not fully mitigate this problem since there is already deficit of 120MW and may still be unaffordable to rural communities.

Bujjagali white water rafting tourist site

Loss of white water rafting tourist site (the only one in Uganda)

Since white rifting started 3 years ago, an influx of 7,000-8,000 tourists are reported to visit Bujagali falls site bringing in US$650,000 plus US$70,000 that is spent within the locality each year.
The Bujagali site has a potential of attracting 40,000 tourists yearly when the infrastructure such as roads and, hotels are put in place.
Considering the international trend of the current development i.e. open free trade, standardized tariffs etc Uganda is not in position of developing sustainable competitive industries and products to match those of developed countries .Uganda and Africa as a whole have comparative advantage in nature (wildlife) tourism over the developed countries and strengthening the tourism sector.
It is thus better to have both power and tourism projects along the Victoria Nile by allowing the already established (and often difficult to set up) tourists site to exist and construct the dam downstream at Kalangala ,or Karuma ,since according to the competitive impact report of the (3) sites (karuma ,Kalangala , Bujagali)by the environmental impacts of the (3) sites are not significantly different on the whole .

3.0 Costs of damming rivers

3.1 Economic costs

The corruption group Transparency International (TI) has just come out with its 2005 Global Corruption Report, which includes a list called Monuments to corruption .Bujagali made this short list, as did another African dam project, the Lesotho Highlands Water Project.

The Bujagali Dam in Uganda, which is being investigated for corruption by the World Bank and four governments after a British subsidiary of the Norwegian construction company, Veidekke, admitted bringing a Senior Ugandan civil servant .The cumulative environmental impacts of Bujagali and other dams have never been assessed.

3.1 Social costs

At the planning and design stage, important social impact has the delay between the decision to build a dam and the onset of construction. Once Bujagali site was identified in 1994, a form of 'planning blight' took place making businesses, farmers reluctant to take up other productive investments in areas that are subsequently to be flooded. Communities lived for almost a decade starved of development and welfare investments. Such psychological stress has not been quantified in economic terms but is a real issue. At this stage, project beneficiaries include those sustained by the business generated by the planning process, including constructors, consultants and workers employed on the project. In the case of Uganda being a developing country with limited dam industry, foreign consulting firms have undertaken preparatory studies.

Displacement is defined here as referring to both `physical displacement and livelihood (agriculture 750,000$, hand crafts, to tourists and fishing) displacement. In the narrow sense, displacement results in the physical displacement of people living in the reservoir or other project area. This occurs not only from the flooding of reservoirs but from the installation of project facilities and associated infrastructure .The WCD Knowledge Base records that all too often this physical displacement is involuntary and involves coercion and force – in a few cases even killing.

3.2 Environmental Costs

Flooding the area will increase the amount of dead vegetation stimulating a process know as Eutrophication which results in a decrease of oxygen in the water and aquatic life suffocating.

The implementation of Bujagali power dam might even escalate already evident drop in the Lake Victoria water level by approximately 2 metres since the Kiira extension dam was constructed. This has resulted in to a drop in power production. This may appear to be a very small figure especially to a layman or an insensitive policy maker. Translating this in absolute terms, it means that 1-meter drop equals 67 cubic kilometres of water in volume and this drop in water level has taken approximately 2.66 years. Now compare this with the average depth of the lake, which is below 40 metres deep food for thought!
Lake Victoria is a shallow lake with maximum depth of 80 meters and an average depth of 40 meters. It has an area of 68,800 Km^2 and a catchment's area of 184,000km and a shoreline of 3,500 kilometres. It holds a volume of 2,760 cubic kilometres though these figures are slowing being altered by human error. The situation above has been blamed on the dry spell that occurred in the last quarter of 2004.

Way forward

- Government should ensure that the project is pro-poor and benefits them;

- Government through public –private partnerships with the environmental NGOs should monitor the project to ensure that the implementer sticks to the agreed EIA;
- Government should ensure the participation and contribution of local communities so that they own and protect the facility.
- Promotion of corporate accountability,
- Legislative reform to have access to information.

Conclusion

Considering the merits and demerits of the proposed Bujagali project, sufficient focus be given to the National importance of the project in a holistic manner. There is no way, in which the proposed project can be implemented in a cost- effective manner without incurring environmental and social costs. It is our view, however, that the developer has adequately addressed these costs in the EIA, and the remaining challenge is for the concerned authorises to effectively supervise and monitor the mitigation measures proposed by the developer.