



CASE STUDY

Cost-benefit-analysis of the Bala dam proposal, Bolivia

Using economics to better show the overall expected impacts of a large infrastructure project

In a nutshell

There were plans for a huge dam for hydro-electric energy production, mainly for export. Cost-benefit-analysis was used to assess the value of the project because it is a widely accepted framework and can combine diverse secondary data about the expected consequences. Despite time pressure and relatively poor data availability, conservative estimates about investment costs, likely returns and environmental damage (along with associated loss of natural assets and livelihoods) were sufficient to raise questions about the project's validity. Solid economics, sound hydrological expertise, fluid networking among experts involved, and well prepared communications work (targeted at the national government level), jointly contributed to a strong policy impact.

1. Background of the cost-benefit analysis

In the late 1990s, the government of Bolivia proposed the development of a hydroelectric dam on the Beni River, largely aimed at generating and selling power to Brazil. Key concerns related to environmental, social, and economic aspects of the proposed project. The area that would have been flooded exceeded 200,000 hectares, and is home to globally important biodiversity. A significant number of indigenous people living in the region would have been displaced, losing access to their livelihoods and homes. If the dam was a bad financial investment, financing the construction of the dam would have been costly to Bolivians more broadly. This was the starting point and opportunity for economics to influence decision-making.

While the national government was not significantly involved, the regional government of La Paz promoted the dam as a mega-investment, politically important because La Paz had lagged other Departments (administrative regions) of Bolivia in investment and growth. Environmental organizations such as the Environmental Defense League, Conservation International, Wildlife Conservation Society, and Fobomade opposed the dam, because of the extremely high biological diversity. Local indigenous people, such as Tacana, Tsimane and Mosekene, would have lost most of their territories to flooding. Local non-indigenous people potentially affected by the project, located downstream of the dam in Rurrenabaque/San Buenaventura, expressed concerns about lost navigability up the Beni River. Hydrology experts were also concerned about the risks of the project and generally favoured smaller hydro projects higher in the Andes.

There was a small window of time in which an opportunity existed to impact the decision about whether or not to build the dam. Two representatives of the Blue Moon Fund, who were familiar with the context, contacted the Conservation Strategy Fund (CSF) and made connections to key contacts in Bolivia. The objective of the planned study was to conduct a comprehensive and technically solid evaluation of the dam's economics, taking into account social and environmental impacts.



2. Designing the study

During an initial field visit to the dam site and some of the areas that would have been affected, the lead economist of the study (CSF) determined what data would be needed. Time and budgetary restrictions required the study to rely entirely on secondary data. Therefore a lot of time was spent gathering existing data and cooperating with a broad set of experts and advocates, who could provide information and important perspectives.

The study was designed as a standard Cost-Benefit Analysis (CBA), including environmental costs and distributional impacts. While these additions are consistent with a standard CBA approach, they are frequently left undone. CBA was chosen as a technically robust and standard tool for addressing the desirability of investments. As such, it is well understood and hard to argue against on principle. After initial back of the envelope calculations, it was estimated, using reasonable assumptions about costs, returns and risks, that the project was likely going to result in significant net losses. Efforts were therefore focused on evaluating the internal costs and benefits of the project rather than calculating externalities, as the former were seen to be more convincing to policy makers. If the “standard” economics had not made the point, rigorous ecosystem services valuations would have been necessary.

The study aimed to answer the following questions:

- What were the key cost categories?
- What was the likely return?
- What were the ecosystem services that would have been lost and which could be estimated quickly?
- What was the scope of uncertainty around all of the above?

3. Applying the cost-benefit analysis and communicating the results

Throughout the study process, the study team mostly interacted with environmental advocacy organizations and with expert hydrologists. The environmental organizations provided data and helped with contacts and logistics that made it possible to carry out the study on a short time-frame. Experts from the National Institute of Hydrology contributed maps and hydrology data. Formal and informal interaction created a strong alliance and formed the basis for concerted communication efforts of the study’s results.

As the study did not use primary data, information was generated by combining available data (e.g. number of people who would be displaced) with values that could be extrapolated to the area (e.g. timber density, cost of building transmission lines), with economic common sense (e.g. risks inherent in trying to sell to the Brazilian market). The study included among other ecosystem service values the direct use values lost by displaced people, tourism values for neighbouring communities, CO² sequestration, and the existence value for Bolivians (from a ratio of use values to non-use values based on literature). Some important ecosystem services, e.g. fisheries, were not quantified due to uncertainties. Conservative assumptions were made throughout the study to ensure that findings could not be interpreted as driven by assumptions favourable to the conservation-friendly option.

The study found that the project costs were USD 1.8 billion (capital costs of construction plus the cost of transmission lines plus a reasonable estimate of potential cost overruns). Under reasonable assumptions about factors such as river flow, efficiency of the dam, and access to markets, the investment would bring a net financial loss of more than USD 400 million.



The study used exhaustive sensitivity and risk analysis to show awareness of the uncertainty of specific parameters in the analysis. The outputs of these analyses were shown alongside Net Present Value results in the public presentation.

It was decided to plan the communication of results in a way that could generate national attention. Press releases, close contacts to media and large public events led to high media exposure and attracted the attention of government. Private meetings with policy makers followed the public presentation of results and upon request from Government officials. Even though officials were disconcerted with the negative findings about the project, they expressed genuine interest, not having had previous access to an objective study.

4. Making use of results and reflections

At follow up meetings, the lead economist of the study explained the study methods, including the use of valuation, cost-benefit, and risk analysis. The study and accompanying process made an important contribution to stopping the project. Perhaps due to prior lack of transparent information on the dam, many people were curious and potentially open to hearing and acting on such information.

The study is an example of using economics to demonstrate that trade-offs between conservation and development are not always necessary. To channel the study results into the political processes, it was essential to correctly apply a well-understood tool that is technically robust and to cooperate extensively with other organizations. Attracting national media attention, rather than having quiet, private meetings with government, proved to be a successful approach.

The study contributed to better-informed decision making. However, it should be noted that the current government (2015) is once again considering the project.

5. Further reading

[Two Roads and a Lake](#), John Reid, Conservation Strategy Fund, 1999.

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