This document summarizes the detailed economic analysis study report, In Debt and In the Dark – Unpacking the Economics of DRC's Proposed Inga 3 Dam by International Rivers. The study is the first in-depth analysis of the economics of the proposed Inga 3 project. It evaluates claims by the project's proponents that the dam will generate revenue, expand electricity access, and create jobs, and it examines the risky financial investments that the Democratic Republic of Congo (DRC) will have to make for the project.

The analysis shows that Inga 3 would most likely cause a financial loss for the DRC, rather than delivering the promised revenue. In the most likely scenario, the DRC would lose $22 billion over 35 years and jeopardise its credit standing. In addition, the project would generate much less power than projected, the bulk of which would go to South Africa with little expansion of access within the DRC. Lastly, the project would destroy more than ten thousand livelihoods in favour of a few hundred permanent jobs created at a very high cost. Inga 3 would not improve the chronically high employment rates in the DRC.

The Inga 3 project is a highly risky investment with very poor prospects of delivering socio- economic benefits for the DRC's financial position and its people. The investment earmarked for Inga 3 could yield more equitable and sustainable access to electricity in the DRC if it is directed towards wind and solar generation of electrical power. This option would not only provide cheaper power across a greater geographic spread, but it also poses a lower risk to the country's debt rating.

CONGO RIVER | Sunrise Photo credit: Wikipedia

1. Introduction and Background

1.1 The Grand Inga and Inga 3 projects

The proposed Inga 3 Dam would be built on the Congo River as the first in a planned series of hydropower projects, collectively referred to as the Grand Inga. The grand scheme is anticipated to provide a total of 40 MW of power not only to the DRC but also other countries on the African continent. The bulk of Inga 3's production is earmarked for South Africa, with the remainder to be shared between Kinshasa and the mines in Katanga Province.

1.2 Approach to the analysis

The analysis draws on empirical evidence of the performance of similar hydropower projects all over the world to lay out a set of five possible scenarios for Inga 3. The scenarios range from an optimistic best-case to a pessimistic worst- case scenario. The project proponents have made claims based on the best-case scenario, under which the Inga 3 is expected to:

- Generate revenues that the government can allocate to poverty reduction programmes;
- Provide electricity to more people in the DRC; and
- Create jobs in a country that has a long history of a high unemployment rate.

The analysis examines the prospects of these anticipated benefits under each of the five scenarios.

2. Examining The

Different Scenarios

2.1 Overview of the possible project scenarios

The five possible scenarios are best, good, median, worse and worst case. The median scenario represents the most realistic assumptions of the project's performance[1]. The best and worst-case scenarios, both highly unlikely but not impossible, represent the two extremes of favourable and unfavourable conditions respectively. Table 1 summarises the scenarios and socio-economic outcomes under each.

In the median case scenario - the best estimate of what would happen based on the reasoned scenarios above- DRC would experience a $618 million loss each year from Inga 3

Table 1. Scenarios and their associated socio-economic outcomes

	Conditions and assumptions	Revenue (Per Year)	Electricity available for the DRC
1	Best U.S. $12 billion cost, low cost finance, 80% Capacity Factor,	7 cents per kWh to South Africa, 12 cents for the mines and 7.87 cents for Kinshasa residents	$749 million 994 MW
2	Good $14 billion cost, 75% Capacity Factor	$78 million	692 MW
3	Median (Most likely)	$16 billion cost (30% overrun), 70% Capacity Factor	Loss of $618 million 388 MW
4	Worse $20.4 billion cost, 65% Capacity Factor	Loss of $1,501 million	79 MW
5	Worst $24 billion cost (100% overrun), 60% Capacity Factor, highest transmission losses	Loss of $2,078 million	0 MW

[1] These most realistic assumptions on conditions and outcomes are derived from the analysis of previous projects, the financial position of the DRC and other evidence on job creation.

2.2 Projected benefits under the different scenarios

2.2.1 Inga 3 will not generate the promised revenue

The generation of revenue declines

sharply from the best to the worst case[2]. The best-case scenario assumes that the project will be built on time, on budget at a conservative cost of U.S. $12 billion, with low interest rates that will not increase over 35 years. It also assumes the dam will operate at a high capacity of 86% and sell the power at competitive rates (Table 1)[3] . However, the evidence from other projects and previous experience with Inga 1 and 2 contradict these claims. They show that:

• Time and cost overruns are inevitable in projects of this nature and scale[4];

• Inga projects have a demonstrated history of time and cost overruns; and

• Operation at such high capacity (86%) is highly unlikely. The world's most efficient hydro plants operate at 70% efficiency, with the average being 44%. This will impact the total revenue that can be realised.

In addition to the above, the selling price of the electricity is not guaranteed, as the agreement with South Africa does not include a tariff. In addition, the mines in Katanga Province are already paying between U.S. 10 and 12 cents per kWh for their power. Therefore, there is a high likelihood that the power to the mines and South Africa will eventually be sold at much lower prices than projected[5] as there is no need for the mining companies to pay the 12 cents per kWH projected in the best-case scenario.

2.2.2 Inga 3 will provide limited if any expansion of electricity access within the DRC

Inga 3 is unlikely to deliver the projected 4,000+ MW; an average of 3,329 MW is more likely. Further, South Africa is expecting to receive an allocation of 2,500 MW. This means that in reality, it would take up more than the projected proportion of the production, thus reducing the amount of power available to the DRC. Therefore, in the median, most likely scenario, only 3% of the production from Inga 3 will be available to non- mining businesses and residents of Kinshasa. This translates to additional access for only 340,000 people in Kinshasa only, in a country where between 84% and 86.5% of the population do not have access to electricity. There would be no increase in access in any other areas. In the worst-case scenario, domestic consumers would receive no additional power at all. Increased electricity access, if any, will therefore most likely be very limited.

2.2.3 Inga 3 will destroy more livelihoods than it creates

Project proponents estimate Inga 3 will create up to seven thousand temporary jobs at the peak of project construction. After construction, only a few hundred direct permanent jobs will remain, at a cost of U.S. $5 million in concession

loans per job. Similarly, the temporary jobs will cost $1 million dollars each. On the other hand, Inga 3 will displace and destroy the livelihoods of more than 10,000 people. The Inga 3 project would also have to compensate those impacted by the dam, thereby increasing costs. These costs, expected to be substantial, are not included in the analysis.

BARAGE INGA | Congo River

[2] The revenue calculation for each scenario took into account price, amount of power sold, technical losses as well as construction, operating and borrowing costs. [3] The researchers argue that there is a likelihood that part of the returns would go to private investors as profit, as opposed to revenue for the government. [4] The estimate is a median cost overrun of 30% and a mean of 70%. The larger projects experience greater percentage overrun. The transmission line to South Africa will be the longest in the world and longer lines experience greater overruns. [5] There have been assertions that political considerations may lead the DRC to accept low tariffs from South Africa.

3. Inga 3: An Ill Advised and Risky Investment for the DRC

Financing the Inga 3 is a huge economic risk for the DRC, particularly in light of the unequal sharing of benefits. Even in the best-case scenario, South Africa will take more than half of the power, and up to 100% in the worst-case scenario[6], with no reasonable prospects of revenue

generation to support the DRC's social and economic advancement.

Revenues from Inga 3 would not cover the DRC government's debt payments for the project, let alone constitute a windfall for the government

The DRC government will need to externally finance its contribution to the Inga 3, which poses grave threats to its debt rating. External financing for Inga 3 would, depending on the scenario, take the country's debt to between $9.5 and $12.5 billion. The International Monetary
Fund (IMF) and World Bank could thus move DRC's rating from moderate to high risk of debt distress. The sheer amount of the loans would also reduce the DRC's borrowing opportunities. The increased indebtedness and risk of debt distress would reduce the opportunities for lower-interest loans. This would plunge the Congolese people further into the cycle of poverty and external debt.

4. Alternative Electrification Investment Options

The low rates of access to electrical power negatively impact the DRC's overall development and advancement. Decision-makers could increase electricity access in the DRC using other less risky, more equitable options.

If the DRC moved forward with Inga 3, it would be expected to contribute 25% to project costs: $3 billion in the best-case scenario. If DRC made an investment of $3 billion into micro-hydro and solar generation, it could increase electricity consumption by 48% and reach an additional 2.7 million Congolese people spread across the country. Investment in mini hydro generation is the most attractive option, with significantly cheaper electricity (1.8 and 3.1 US cents per kWh), followed by solar PV. (April 2019)

[6] Which in any case still assumes a higher than average production capacity.

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