

# IS THE GRAND INGA

*The Grand Inga Dam, Africa's dream to light the continent, is set to be the of the Three Gorges Dam in China. Controversy surrounds the project*

*On invitation by ESI Africa, International Rivers' Africa Programme Director, Rudo Sanyanga, examines worldwide large-scale hydropower projects and Africa's Grand Inga Dam.*

The Democratic Republic of Congo (DRC) has plans to build the world's largest hydropower project, the Grand Inga at the Inga Falls, on the Congo River, some 50km upstream of the mouth of the Congo on the Atlantic coast. The Inga rapids and waterfalls give the Congo River a huge hydropower potential, which has been targeted by developers since the early part of the last century. With a phenomenal generation capacity of 40 000MW, the Grand Inga is expected to bridge the energy gap for Africa, with a number of countries, especially South Africa, expected to be supplied by it.

In design, Grand Inga is very complex and consists of eleven dams and seven hydropower generation stations, of which the Inga 3 Basse Chute (Low Head), with a design capacity of 4 800MW is the first phase. Current designs for Inga 3 and subsequent phases of Grand Inga will result in

diversion of the mighty Congo River, thereby creating a reservoir that would flood the Bundi Valley.

The question that has been repeatedly asked by many who are engaged in the debate of the Grand Inga is 'Will this project ever be realised?' It then begs the question, 'Why is there so much opposition to and controversy around this project?' In this short brief, I shall attempt to give a glimpse of the situation of the energy sector in the DRC in the hope of providing some answers to the two questions.

In a workshop I attended in 2014 in Johannesburg, an investment banker from Standard Bank called Inga 3 'Too Big to Fund ... Too Big to Build'. From an investor's point of view, he said, the Inga 3 and Grand Inga project are far too risky economically and only the daring would put their money into this project. The Grand Inga is not a cheap project. A costing that was done ten years ago

estimated it at over US\$80 billion. Of that, US\$12 billion would be for the initial Inga 3 Basse Chute phase of the project. These figures become more gigantic when compared to the country's GDP that was estimated at US\$13.6 billion in 2013.

Comparing it with to two of the largest hydropower projects, both the Three Gorges and Itaipu dams pass on engineering technology and efficiency of



Inga Dam

# 'TOO BIG TO BUILD?'

*world's largest hydropower scheme, producing 40,000MW, more than twice that and questions are asked whether the dream will ever become reality.*

	Itaipu Dam	Three Gorges Dam
Location	Parana River, Brazil & Paraguay	Yangtze River, China
Size	1 350 km <sup>2</sup>	1 million km <sup>2</sup>
Capacity	12 600MW	20 000MW
Construction Period	1975-1993 18 years	1994-2006 12 years
Cost Overruns	Final cost USD \$20 billion, 488% higher than original	Initial cost USD 9 –10 billion and final cost USD 37.2 billion (official figure)
Corruption	Alleged that government officials accepted a shoddy royalty deal with private sector.	12% of resettlement and compensation funds embezzled
Local Capacity/Skills	Built by Brazilian and Paraguay companies. Since Itaipu, Brazil has developed its own technology to build large dams.	Imported technology but turbines and generators manufactured locally
Benefit Sharing	26% of Brazil's power 78% of Paraguay's power	Provides electricity to nine provinces in central, east and south of China; and two cities including Shanghai
Maintenance & Operation	Very efficient Annual generation 98.8% in 2013 and 87.8% in 2014	Well maintained Annual generation in 2014 was 98.2%
Main Environmental Impacts	Loss of the Sete Quedas waterfall Climate change impacts – producing methane	Serious seismic effects 500 million tons of sediment end in the reservoir Extinction of Chinese dolphin
Main Social Impact	10 000 people displaced Huge problems with compensation	1,3 million people displaced (13 cities, 140 towns & 1 350 villages inundated). People not compensated for land
Economic Impacts	Significant contribution to both Paraguay and Brazil's electricity although most benefits for Paraguay going into private hands	Contributes only 1.7% of China's power against an initial estimate of 10%.

maintenance and operations, which are missing in the DRC. However, should be noted that both dams have had serious environmental and social impacts, which are irreversible. (Refer comparison graph above.)

The second very worrisome risk is whether the country has the capacity to manage such a huge infrastructure project. To do that one needs not look further than the performance of Inga 1 and Inga 2 hydropower project at the same site, which were constructed in 1972 and 1982 respectively (SNEL having been formed in 1970). The performance there can be fairly assessed as having been dismal. These projects were built following feasibility studies that had found both

projects to be uneconomical and far in excess of the country's electricity needs at the time. With installed generation capacities of 351MW and 1 424MW respectively, these hydropower projects have mainly served mines in the south and export markets.

In addition, Inga 1 and 2 have never operated at capacity in their lifetime and their state of maintenance and performance have deteriorated progressively since commissioning, such that by 2002, the projects were reported to be operating at 40% of their capacity. Many reasons were advanced for the poor performance of the power plants, which included financial mismanagement, corruption, poor corporate governance

and lack of commitment to maintenance and repair programmes. These problems that manifested during the era of Mobutu Sese Seko and the civil war have continued to this day. Thus, the Inga dams' turbines and associated electrical infrastructure deteriorated fast, long before the end of their expected lifespan.

Following the signing of the peace treaties in 2003, and the cessation of hostilities between the DRC government and warring factions, the World Bank moved in to rescue the situation, by contributing US\$200 million for rehabilitation of the Inga 1 and 2 plants and the Inga-Kolwezi transmission line that connects the plant to the copper mines in the south, who are the main



Itaipu Hydro Dam



Three Gorges Hydro Dam

internal consumers, as well as export markets in southern Africa. To justify this loan the Bank argued that the rehabilitation would allow the DRC to earn an additional US\$40 million in revenues each year by increasing its power sales to southern Africa. The rehabilitation work was planned to be completed in 2007. Sadly, the implementation faced challenges, delays and huge cost overruns. By 2013 the costs for rehabilitation had escalated to a staggering US\$883 million from the original US\$200 million and the completion date for the work was pushed forward to 2016. It is not even clear that this deadline will be met.

never recovered despite President Kabila firing the two managers of the state owned national utility Société nationale d'électricité (SNEL). Reports claim that many big scandals associated with this project have not been publicised. Over and above this, the utility has failed to implement an efficient billing system and thus has failed to collect revenues. In all this, public sector electricity accounts such as government offices are some of the worst defaulters. Some politicians are even reported to interfere with billing and revenue collection, with the number of illegal connections also reported to be extremely high. The undisputed end result is that most of the power that is generated at Inga 1 and 2 goes unaccounted for.

noticeable change in the way operations are carried out at SNEL. Similarly, elsewhere in the country, less than 10% of the small hydropower schemes that were set up during the Mobutu era under SNEL are still operational, with the rest having gone to ruin.

Many development specialists and multilateral development banks argue that poor access to modern energy is one of the biggest handicaps to economic development in Africa and quickly point out that the huge amount of power that would be made available from the Grand Inga would provide a substantial boost to economic development on the continent. While in theory that may hold some validity, in practice, account must be taken of the myriad of risks. These include technical challenges such as poor maintenance, metering and high transmission and distribution losses; as well as non-technical risks including theft and corruption at all levels associated with this project, some of which are extremely difficult to circumvent.

In light of the above discussion and the facts presented one is persuaded to agree that the Grand Inga is 'too big to build', and in the same breath one is also persuaded to add that 'it is too risky to build'. While there is clearly a considerable need for the expansion of modern energy services, the serious financial risks posed by this planned scheme, as pointed out above, cannot be ignored. <sup>ESI</sup>

Efforts to reform the power sector and restructure SNEL to turn it into an independent commercial entity have been painfully slow, even though government has passed some pieces of legislation to that effect. In 2009 the government passed on new electricity reforms that included an Electricity Code policy. The electricity law was passed in 2013 to create national agencies such as the Electricity Regulation Authority, the National Electrification Fund (FONEL) and the National Electrification Agency (AGENA). The establishment of National Agencies including an Autorité de Développement et de Promotion du Site d'Inga (ADEPI) is still to be effected. Despite these efforts there has been no

**“ Some politicians are even reported to interfere with billing and revenue collection.**

The woes of the energy sector in the DRC are many. The Inga-Kolwezi high voltage direct current (HVDC) line, which runs for 1 725 kilometres, was the single largest contributor to the DRC's national debt burden. While the initial budget was put at US\$250 million, the actual construction costs quadrupled to US\$1 billion. Within 10 years of construction, the line was delivering less than half the electricity that it was designed to carry, due to vandalism and poor maintenance.

It is accepted worldwide that huge infrastructure projects create fantastic opportunities for corruption. The rehabilitation of Inga 1 and 2 was not spared of this curse. In 2008, US\$6.5 million earmarked for Inga 2 rehabilitation went unaccounted for. These funds were



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**ABOUT INTERNATIONAL RIVERS**

International Rivers is a global NGO with programmes in six regions of the world including Africa. Formed 30 years ago, it works to keep rivers flowing and to protect the rights of communities that depend on them. Working together with partners it promotes sustainable solutions for energy development.