

# LOM PANGAR DAM, CAMEROON

## Drought Could Cripple Cameroon's Hydro-Heavy Energy Sector

The government of Cameroon is currently considering building the Lom Pangar Dam, a project that would displace rural villagers, flood protected forests, and increase the vulnerability of Cameroon's economy to climate change. Increased hydropower generation downstream of Lom Pangar would mostly go to a large, foreign-owned aluminum smelter, which is expected to continue receiving below-cost electricity rates subsidized by residential ratepayers. The dam has been discussed for over a decade, but with a growing national energy crisis, the Cameroonian government has recently intensified efforts to obtain financing for the project.

### 1. The Wrong Solution for a Warming World

Lom Pangar would be the fourth dam<sup>i</sup> built to help regulate the Sanaga River for the benefit of the country's two primary hydropower dams, Song Loulou (384 MW) and Edea (264 MW). These run-of-river hydropower dams have experienced significant reductions in power generation due to dry seasons exacerbated by drought. The Government of Cameroon hopes the Lom Pangar Dam will increase these dams' ability to generate power during dry periods by an estimated 105 MW to 216 MW.<sup>ii</sup> This increased electricity would assist the southern Cameroon grid's capacity, where the Alucam aluminum smelter is seeking to double its production.<sup>iii</sup> The dam, proposed for one of the Sanaga's most important tributaries, could significantly alter the river ecosystem, as well as submerge one of Africa's most biodiverse hardwood forests (see section 6). The cumulative ecological impacts of adding yet another dam to this river system are unknown, but could be great.

<b>FAST FACTS</b>	
<p><b>Location:</b> Lom River (Eastern Cameroon) 4 km downstream from the confluence of the Lom River and Pangar River, and 13 km upstream from the Sanaga River.</p> <p><b>Purpose:</b> Regulation of the Sanaga River to increase power generation of 2 downstream hydropower plants, Song Loulou and Edea, during the dry season; hydropower generation at Lom Pangar for the Eastern grid.</p>	<p><b>Dam height:</b> 50 meters</p> <p><b>Reservoir Size:</b> 610 km<sup>2</sup></p> <p><b>Estimated Construction Cost:</b> US \$115 million<sup>iv</sup></p> <p><b>Installed Capacity:</b> 51 MW</p> <p><b>Construction Timeline:</b> 2005 - 2008</p>
<p><b>KEY CONCERNS:</b></p> <ul style="list-style-type: none"> <li>• Cameroon is already 95% dependent on hydro for its electricity; reduced power dependability because of drought is already an issue, and could worsen with climate change.</li> <li>• Despite extremely low levels of electrification for Cameroonian households (less than 5%), the project's primary beneficiary will be the Alucam aluminum smelter, which already consumes about half the nation's electricity at rates subsidized by residential users. Small business and residential customers will remain at risk of blackouts and power shortages.</li> <li>• The reservoir will displace several villages, flood the protected Deng Deng Forest, and negate protections designed under the World Bank sponsored Chad-Cameroon Pipeline.</li> </ul>	
<p><b>Technical Partners:</b></p> <p><u>Environmental Impact Assessment (EIA):</u> Conducted by French companies: ISL, Sogreah, and Oreade; funded by the Government of Cameroon and French Development Agency<sup>v</sup></p>	<p><u>Private Electric Utility:</u> AES-Sonel</p> <p><u>Independent Expert Panel:</u> to review the EIA; facilitated by IUCN, funded by the Government of Cameroon and GTZ<sup>vi</sup> (a German aid agency)</p>

The World Bank's 2003 Country Assistance Strategy (CAS) for Cameroon states: *The Lom Pangar dam has raised some concerns for the World Bank Group because of potential negative social and environmental impacts related to long-term and cumulative changes in the Sanaga river system flow regime. The flooding of a large dam catchment area would affect a portion of the Deng-Deng forest, a biodiversity hotspot explicitly protected under current arrangements in the context of the Chad-Cameroon Pipeline project. A costly adjustment was made to the pipeline route to avoid going through the central Deng Deng forest areas and avoid other dense forest areas.*<sup>vii</sup>

Hydropower already accounts for 95% of Cameroon's electricity supply, virtually all of which is generated on the Sanaga River.<sup>viii</sup> In addition to Lom Pangar, the government has stated its intentions to build another dam on the Sanaga River, the Nachtigal Dam (266MW), further increasing the nation's dependence on this river basin. This heavy dependence on hydro (and one river system) puts Cameroon at great risk for economic disruptions caused by droughts. In 2002, low rainfall resulted in blackouts during the dry season that drove up unemployment and business costs. Electricity generation has been further hampered by reservoir sedimentation and poor maintenance of the dams. But the government appears set on further exploiting hydropower rather than diversifying its energy resources (see section 9). Cameroon's President has reportedly signed a financial agreement with the China International Water and Electrical Corporation (CWE) to assist in building three hydropower dams in Cameroon.<sup>ix</sup>

It is unclear how effective the Lom Pangar Dam would be in regulating the river for better power generation in the face of ongoing droughts and unpredictable climate change. The World Bank has expressed concerns to the government of Cameroon about its energy mix, stating:

*...the current high rate of dependence of electrical power generation in the country on hydropower dams ... makes for high vulnerability to seasonal and longer-term cyclical changes in rainfall and hydrology.*<sup>x</sup>

The 2003 CAS also states:

*In response to Government concerns about reliable and affordable electricity, a more comprehensive examination to explore various scenarios to address short, medium, and long term needs, explicitly incorporating social and environmental concerns, is being undertaken.*<sup>xi</sup>

## **2. Project Origins**

In July 2001, the US-based AES Corporation and the government of Cameroon signed a concession agreement for the World Bank/IFC-advised privatization of Sonel, Cameroon's state-owned electric utility. As part of the 20-year contract, AES agreed to develop the Lom Pangar Dam within seven years if it were found to be the least cost option.<sup>xii</sup> Since privatization, electricity rates for residential consumers have increased by more than 10%. Price hikes led to street protests during massive blackouts in 2002. The World Bank has since expressed concerns about the privatization of Cameroon's electricity sector. A February 2004 Bank report states:

*Only one investor presented a bid ... and was designated as a successful bidder. However, post-privatization performance has been disappointing. The privatized electricity company has not been able to deliver services in the hoped-for combination of quantity and quality owing to several factors, including a severe drought during 2001 and 2002. The significant load-shedding that occurred has caused economic disruption and public outrage.*<sup>xiii</sup>

## **3. Current Status**

Multiple feasibility studies for Lom Pangar were conducted in the 1990s, and, according to IUCN, an updated analysis was completed by the French Development Agency (AFD) in 2000.<sup>xiv</sup> A new environmental impact assessment (EIA), led by the French company ISL, is expected to be completed in mid-2005. A three-member Independent Panel of Experts, facilitated by IUCN, has

been established to review the EIA for compliance with international standards on the project's social and environmental impacts. If the project is approved and financing obtained on the basis of these assessments, construction could begin soon and be completed as early as 2008.

#### **4. Benefiting Big Aluminum**

Aluminum smelting is an energy-intensive industry that often seeks below-cost energy contracts. AES-Sonel's largest customer is the Alucam aluminum smelter, owned by the Canadian company Alcan. Alucam currently consumes nearly half of the energy sold by AES-Sonel. Interested in doubling its aluminum production, Alucam is seeking up to 200 megawatts of additional electricity in order to expand its operation, at rates far lower than commercial and residential rates.<sup>xv</sup> Before the privatization of Sonel, Alucam was paying below cost for its electricity, and just one-tenth the rate charged to residential ("low voltage") consumers.<sup>xvi</sup> Local activists have spoken of the "disheartening equity concerns" over the government's favoritism toward Alucam. About 95% of Cameroonians do not have access to electricity.<sup>xvii</sup> If Alucam expands operations as planned, small businesses and residential users would see little benefit from Lom Pangar.

The World Bank has concerns about Alucam's energy use, and talked to Cameroon authorities about:

*links between the imperative of expanding low-cost power generation capacity and the substantial requirements for aluminum smelting (which currently benefits from below-cost power), and is encouraging and offering to assist with an in-depth assessment of the optimality of aluminum smelting operations (especially an intended expansion of such operations) as an integral part of assessing long-term options for the expansion of power generation capacity.<sup>xviii</sup>*

#### **5. Dam-Affected People**

The large reservoir necessary for this project will dislocate a number of villages, requiring resettlement in the outer regions of Pangar. In January 2004, traditional chiefs of local villages met with state authorities and were told their communities would be displaced and resettled.<sup>xix</sup> There is great concern, however, about the implementation of these measures. Complaints from locals are being compiled for review. Many of these villagers, already impacted by the Chad-Cameroon Pipeline, are wary of Lom Pangar. In 2004, locals told the Independent Expert Panel that they needed more information about the project, especially about its benefits and environmental risks.<sup>xx</sup>

The Expert Panel's initial report (April 2004) details the history of dam projects in Cameroon, specifically noting the lack of energy benefits and job opportunities materializing for affected communities, while increased health risks have strained over-burdened local health care systems. Since other dam projects in Cameroon have brought large numbers of migrants and commercial fishermen to their reservoirs, local populations are also concerned about the influx of new people to the Lom Pangar region, leading to increased demands on local resources such as hunting and fishing grounds.

#### **6. Drowning the Deng Deng Forest**

The Lom Pangar reservoir would submerge areas protected as mitigation for environmental impacts of the World Bank-sponsored Chad-Cameroon Pipeline, including parts of the Deng Deng Forest. The Deng Deng Forest (part of the greater Guinea Forest) not only has one of the highest levels of biodiversity in Africa, it is also one of the last remaining hardwood forests on the continent. For these reasons, great attention was given to protecting the forest from direct and indirect impacts of the pipeline. Yet the ecological value of the Deng Deng Forest has not been included in the cost-benefit analyses for Lom Pangar.

Cameroon has already experienced massive deforestation due to logging for export (primarily to Europe and Asia). Almost half of Cameroon's historic forest area has been cleared for agriculture

and settlements.<sup>xxi</sup> The government of Cameroon is reportedly very interested in logging the high-priced tropical hardwoods found in the Deng Deng. Anonymous sources report that concession agreements to log the forest have already been signed, and logging roads into the area are rumored to already be built. Additional access roads that would be built for dam construction could lead to increases in illegal logging and corruption in the region, already a widespread problem in Cameroon.

Due to controversy surrounding the pipeline, the World Bank assembled an International Advisory Group (IAG) to oversee the implementation of the project. IAG reports have consistently noted the risks of the Lom Pangar Dam. Following are some relevant excerpts:

*There is an even greater potential threat to the [Deng Deng] site from the possible construction of a hydroelectric dam across the Lom-Pangar. This would flood a part of the protected forest (as well as part of the pipeline).<sup>xxiii</sup> (June 2003)*

*If this dam is constructed, a large portion of the Deng-Deng forest will be submersed, as well as part of the pipeline, which was not constructed with this eventuality in mind<sup>xxiii</sup>. (January 2004)*

*[The IAG finds policies for environmental protection have not been implemented.] These legal and technical voids increase the risk of impact on the environment and hence on the population, not only for the pipeline Project but for other major projects to come, such as the Lom-Pangar dam....<sup>xxiv</sup> (July 2004)*

Destroying these protected areas will result in a serious violation of trust for all those involved in ensuring that environmental safeguards were respected for the Chad-Cameroon Pipeline. The World Bank's reputation will suffer a serious blow should the project go forward unimpeded by previous World Bank agreements to protect the Deng Deng.

## **7. Uprooting the Chad-Cameroon Pipeline**

The construction of Lom Pangar, as designed, would not only result in the destruction of the forest that the pipeline project team sought to preserve, but the dam's reservoir would submerge the land under which 20 km of the pipeline crosses. Because it was not built to withstand the extra pressure of the reservoir, the pipeline would have to undergo a costly excavation and either be rerouted or reinforced, resulting in a stop in oil flow for a period of time, with associated costs, as well as unknown environmental and social risks, such as additional damage to land and spills.

After formal complaints about the World Bank's Pipeline project were received, the independent Inspection Panel noted in its investigation report that the Lom Pangar Dam would:

*...pose a problem for the integrity of the Pipeline Project since it would have to be re-excavated and concrete weighting provisions added. It would also possibly threaten the newly established Mbam Djerem protected area as water access would now be provided.<sup>xxv</sup>*

Project sponsors have already spent a good deal of money (\$18 million by some accounts) re-routing the pipeline to avoid the Deng-Deng Forest. It is currently unknown how much money it will cost to reroute the pipeline or reinforce it to withstand a reservoir, but clearly these costs would be substantial, and could conceivably be put to better use, such as supporting poverty reduction projects in local villages or improving protections for Cameroon's remaining biodiversity hotspots. Project insiders believe that re-routing the pipeline for the dam could lead to a confrontation between project sponsors and the Cameroon government over who should shoulder the added costs, as well as over the legality of flooding the protected forest areas.

## 8. The Way Forward

After a global review of large dam projects, the World Commission on Dams (WCD) released its final report in 2000, which set forth recommendations for a transparent, multi-stakeholder process to objectively assess a nation's water and energy needs and choose appropriate options.<sup>xxvi</sup> The WCD's recommendations, if followed, would help ensure that a particular large dam project has been found to be the most effective solution while guaranteeing that affected communities share project benefits without disproportionately bearing the project's risks. To follow WCD recommendations, a project must start with a needs assessment rather than starting with a proposed solution to an undefined problem. A needs assessment is followed by an options assessment that engages all stakeholders and utilizes a transparent decision-making process.

The Cameroon government is attempting to show compliance with WCD recommendations by utilizing an Independent Expert Panel to review the project's EIA. The Expert Panel is charged with ensuring that Lom Pangar complies with international standards for social and environmental impact mitigation, including the WCD and World Bank safeguard policies,<sup>xxvii</sup> and will assist with public consultations and mediation should environmental disputes arise. The panel was originally contracted for one year (until December 2004, though work is continuing) and is being facilitated by the IUCN. While an admirable effort, the Expert Panel will only assess the environmental review, not the project in its entirety. The Panel's mandate leaves out vital parts of the WCD recommendations, and will likely result in a weak approach to assessing the project, and broader national energy planning processes, without significant comparison against the WCD.

## 9. Project Alternatives

While the EIA is expected to include a limited analysis of project alternatives (though not necessarily ones that have been fully evaluated to the extent that Lom Pangar has been), comprehensive needs or options assessments for Cameroon's energy sector have not been made public. While the need for more reliable electricity is clear, the public has not been involved in the energy planning process thus far. The construction of Lom Pangar Dam will happen without the benefit of a comprehensive and participatory options assessment.

Cameroon has great potential for saving energy through demand-side management and efficiency measures. Over 30% of the electricity generated in Cameroon is lost during transmission.<sup>xxviii</sup> Improving the efficiency of transmission lines could go a long way to lowering Cameroon's need for additional power. AES-Sonel also notes that most power stations have been neglected and need sizable repairs.<sup>xxix</sup> It is not clear that demand-side options are being fully considered prior to new supply projects such as Lom Pangar or thermal power plants.

Cameroon also has a large reserve of natural gas. The World Bank states:

*Cameroon's natural gas potential has not been fully explored or exploited. While much of the natural gas was flared in association with oil production, nonassociated gas was left untapped. Domestic use of natural gas would assist the country's development in the following ways:*

- *The introduction of gas for power generation, which should be considered in the longer term as an alternative to costly hydro schemes;*
- *The use of gas as fuel in the conventional industry, to save oil for exports while improving the performance of Cameroonian industrial sector.*<sup>xxx</sup>

AES-Sonel is currently undertaking development of natural gas and oil power stations to help diversify Cameroon's energy resources, but progress has been slow. AES-Sonel is also currently contracted with the Institute of Geological and Mining Research for renewable energy research, but the contract is only for one year and renewable energy development and decentralized, rural electrification do not appear to be priorities.<sup>xxxi</sup>

## 10. Conclusions

Insiders have said that the Cameroon Government has every intention of building the Lom Pangar Dam and that completing the EIA and using the Expert Panel are simply necessary steps to appease international donors. However, the dam is not being assessed against other energy alternatives in a comprehensive needs and options assessment. Nor is the process being made transparent or open for public participation. Transparency has been named a goal by the government, but needs to be demonstrated by real engagement of affected communities in the project process, and release of the AES-Sonel concession agreement and Lom Pangar studies.

The World Bank, too, must take a public stand on this project and its impacts on protected forests offset for the Chad-Cameroon Pipeline. As one former project staffer said, “This project poses huge risks for the Bank’s reputation. We need to follow through on our promises. This is a moral issue.”

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<sup>i</sup> Mapé Dam is located on the Mapé River; Mbakaou Dam is located on Djerem River; and Bamendjin Dam is located on the Noum River. Independent Expert Panel, *Rapport de Mission*, 17 April 2004..

<sup>ii</sup> Quotes include 105 MW (UNDP / WB ESMAP, Africa Gas Initiative Cameroon Volume III, February 2001, p. 31); 170 MW (OECD, *African Economic Outlook – Cameroon*, 2004, p.103); and 216 MW (‘Cameroon Country Profile’, *International Water Power & Dam Construction*).

<sup>iii</sup> UK Trade & Investment, *Electricity Market in Cameroon*, [website]

<http://www.trade.uktradeinvest.gov.uk/energy/cameroon2/profile/overview.shtml>.

<sup>iv</sup> UNDP / WB ESMAP, Africa Gas Initiative Cameroon Volume III, February 2001, p. 31.

<sup>v</sup> OECD, *African Economic Outlook – Cameroon*, 2004, p.103.

<sup>vi</sup> F. Neumann-Silkow, E. Hellstern, H. Brühl, *Implementation of the WCD recommendations within German Development Cooperation*, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, June 2004, p. 18.

<sup>vii</sup> Cameroon Country Office, *Country Assistance Strategy*, World Bank, 14 August 2003, p. 20..

<sup>viii</sup> Ibid.

<sup>ix</sup> ‘Chinese Dams?’, *Africa Energy Intelligence* No.356, 28 October 2003; ‘China to fund hydro-electric dam projects in Cameroon’, *Agence France-Presse*, 8 October 2003.

<sup>x</sup> *Management Report and Recommendation in Response to the Inspection Panel Investigation Report*, World Bank, 10 June 2003, p. 13.

<sup>xi</sup> Cameroon Country Office, *Country Assistance Strategy*, World Bank, 14 August 2003, p. 20.

<sup>xii</sup> Anonymous, 29 September 2004; C. Akong, ‘Power Privatization in Cameroon, the Chad Oil Pipeline and Skewed Development’, *Pambazuka News*, 19 February 2004.

<sup>xiii</sup> *Third Structural Adjustment Credit (Credit No. 3102-CM) Release of the Second Privatization Support Floating Tranche - Waiver of Two Conditions and Release of the Transport Support Floating Tranche - Partial Waiver of One Condition*, 25 February 2004, p. 4.

<sup>xiv</sup> [http://www.iucn.org/places/brac/programme/lompangar/lompangar\\_activities.htm](http://www.iucn.org/places/brac/programme/lompangar/lompangar_activities.htm).

<sup>xv</sup> *WB Management Report and Recommendation in Response to the Inspection Panel Investigation Report*, World Bank, 10 June 2003, p. 13.

<sup>xvi</sup> C. Akong, ‘Power Privatization in Cameroon, the Chad Oil Pipeline and Skewed Development’, *Pambazuka News*, 19 February 2004.

<sup>xvii</sup> <http://www.camnet.cm/ingeni/siteinge/sonel.htm>

<sup>xviii</sup> *WB Management Report and Recommendation in Response to the Inspection Panel Investigation Report*, World Bank, 10 June 2003, p. 13.

<sup>xix</sup> A. Chedjou, ‘Barrage de Lom-Pangar: Les villageois inquiets’, *Journal Bubinga*, 7 June 2004.

<sup>xx</sup> Independent Expert Panel, *Rapport de Mission*, 17 April 2004.

<sup>xxi</sup> <http://www.globalforestwatch.org/english/cameroon/forests.htm#people>

<sup>xxii</sup> IAG, *Report of Visit to Chad and Cameroon April 21 to May 10, 2003*, June 2003, p. 32.

<sup>xxiii</sup> IAG, *Report of Visit to Cameroon December 1 to 5, 2003*, 28 January 2004, p. 5.

<sup>xxiv</sup> IAG, *Report of Visit to Chad and Cameroon May 17 to June 5, 2004*, 9 July 2004, p. 26.

<sup>xxv</sup> Inspection Panel, Cameroon: Petroleum Development Pipeline Project and Petroleum Environmental Capacity Enhancement, 12 May 2003, p. 37.

<sup>xxvi</sup> WCD, *Dams and Development: A New Framework for Decision-Making*, 2000.

<sup>xxvii</sup> Independent Expert Panel, *Rapport de Mission*, 17 April 2004.

<sup>xxviii</sup> OECD, *African Economic Outlook – Cameroon*, 2004, p.102.

<sup>xxix</sup> S. Tetchiada, ‘Flicking the Switch on Growth’, *IPS News Service*, 4 August 2004.

<sup>xxx</sup> <http://www.worldbank.org/html/fpd/energy/AGI/homepage.html>

<sup>xxxi</sup> J. Pefok, ‘AES-SONEL Signs Convention to Improve Generating Facilities’, *The Post*, 16 February 2004.