

Dams Planned for African Rivers

This information is compiled by International Rivers Network's Africa Program

The information below is not comprehensive; it is a working document meant to provide a basic synopsis of known, planned dams in Africa.

Updated: May 2006

ANGOLA: Capanda Dam

Under construction

OUTSIDE INVOLVEMENT: Brazilian companies

Brazilian construction group Odebrecht is in the final stage of construction of the Capanda Dam on the River Kwanza, which in the future will have a capacity of 520MW once four Russian-built turbines supplied by Technopromexport go online. Capanda Dam provides power to the cities of Malange and Luanda. Capanda is the largest ever civil construction project in Angola. It was started in 1986 with a state investment of \$750 million paid in oil supplies to foreign companies. An estimated \$4 billion has been invested in the project, with construction work carried out by Brazilian and Russian companies. However, the dam has yet to produce any hydroelectric power and it is seen in some quarters as something of a white elephant.

Capanda was supposed to start generating power in December 1993. However, Capanda was attacked by rebels in November, 1992 and they occupied the area until December, 1994. The dam was badly damaged, and rehabilitation didn't start until 1998. Capanda was attacked again in 1999, and was paralyzed once more. Construction resumed in January 2000. The total cost of war damage to Capanda is well over \$400 million.

Technically, there are two phases to the Capanda project, the first involving the construction of two 130-megawatt turbines. The second phase would bring the total power generating capacity of the dam to 520 megawatts. This would surpass the whole of Angola's current hydroelectric capacity.

ANGOLA: Other new dams/ rehabilitations

Likely

Following the country's long civil war, numerous incomplete or damaged dam projects are set for completion and rehab. Projects are likely to be completed due to extreme energy and water needs in the country. The government aims to build seven more hydroelectric dams along the Kwanza River which would generate a total of 5,000 megawatts. Most of this power would be exported to other countries in southern Africa.

BENIN/NIGER: Dyodyonga Dam

In the balance

This private-sector 38MW hydro dam on the Benin-Niger border would have significant environmental impacts, inundate archaeological sites and impact the "W National Park" in Niger, which is a World Heritage Site. Local environmentalists are poised to oppose the feasibility stage project. According to the World Heritage Committee of UNESCO, "The project's electrical production will not be assured all year long as the Mekrou River

flows only 4-5 months a year. With the high rate of evaporation, erratic rainfall and cyclic droughts that affect the semi-arid countries on the periphery of Sahel, the sustainability of the dam is not assured. The dam would be built in an area that includes one of the most beautiful riverine forests in West Africa, which constitute the refuge and important habitat for many endangered animal species. It is estimated that more than 3500 hectares of riverine forest will be flooded and permanently lost, as will a major tourist attraction in the region, the Mekrou gorges.” The reservoir will also increase waterborne illnesses such as malaria, river blindness and bilharzia. The Mekrou valley also contains ancient funeral sites and prehistoric technological sites. UNESCO reported in 2003 that archaeological finds of an old ancient city and a tomb thought to be several million years old had recently been discovered.

BENIN/TOGO: Adjarala Dam

In the balance

OUTSIDE INVOLVEMENT: China Export-Import Bank

The 96-MW Adjarala Dam would be the second large hydropower dam on the Mono River between the countries of Benin and Togo. Partial financing for construction of Adjarala has been offered by the Export-Import Bank of China (24M Euros) in exchange for supply contracts. An undated summary of the Environmental Impact Assessment notes negative impacts including displacement of over 8,000 people (75% in Togo, 25% in Benin), increased coastal erosion, and reservoir pollution from upstream factories. Greenhouse gas emissions will likely be high due to inadequate removal of vegetation in the area of the reservoir. The Benin Electricity Corporation (CEB) is responsible for the project. The project has been considered for nearly 10 years, and follows the Nangbeto Dam, which was commissioned upstream in 1987. Nangbeto Dam created disastrous impacts for resettled communities after World Bank financing was approved without a resettlement plan.

CAMEROON: Lom Pangar Dam

In the balance

OUTSIDE INVOLVEMENT: French Development Agency (funding EIA), IUCN with funding from GTZ /Germany (monitoring EIA), US-based AES Corp. (owns national electricity company), World Bank possible, China Exim Bank possible

In late 2005, the government of Cameroon released the environmental impact assessment for the Lom Pangar Dam, a project that would flood protected forests, displace rural villagers, and increase the vulnerability of Cameroon’s economy to climate change (the nation is already 95% dependent on hydropower). 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 president of Cameroon has identified the construction of Lom Pangar Dam, Nachtigal Dam, and an expansion of the aluminum sector as priority projects. The dam has been discussed for over a decade, but the Cameroonian government has recently intensified efforts to obtain financing for the project. See Nachtigal Dam below. For more information, visit <http://www.irn.org/programs/lompangar/>.

CAMEROON: Memve Ele Dam

Being studied

OUTSIDE INVOLVEMENT: Central African Development Bank, Japan International Cooperation Agency

In March 2005, Africa Intelligence Online reported that the government is considering this hydropower project. "Another project under study is for a 200 MW plant at Memve Ele on the Ntem river. Feasibility studies on the project were financed in the 1990s by the Japan International Cooperation Agency. The Banque de Developpement des Etats de l'Afrique Centrale (BEAC) could offer to help finance the project," the news service reports. EIA studies are now underway. It is unclear for whom the power would be supplied, as it is in a relatively unpopulated region, but there may be mining interests nearby.

CAMEROON: Nachtigal Dam

Being studied

OUTSIDE INVOLVEMENT: Alcan (Canada)

The construction of Nachtigal Dam on the Sanaga River rests on the completion of Lom Pangar Dam as an upstream reservoir dam. Nachtigal is proposed as a run-of-river dam. In October 2005, Canadian based Alcan, part owner of Cameroon's Alucam aluminum smelter, signed a letter of intent with the government of Cameroon for an expansion of the aluminum sector worth US\$ 900 million. The agreement includes that Alcan will build and operate Nachtigal Dam for the purpose of providing electricity to the expanded. The EIA is reportedly underway.

DRC: Inga I, II rehabilitation

Underway

OUTSIDE INVOLVEMENT: World Bank, MagEnergy a wholly owned subsidiary of Canadian based MagIndustries, German-based Siemens, Eskom (SA) possible, Russian Aluminum possible

Inga I (351 MW) was built in 1972 and Inga II (1,424 MW) was built in 1982. Poor maintenance during the civil war left the two dams heavily silted and operating at only about 30% of capacity, according to the US Energy Information Administration and other sources. Rehabilitation of Inga II is now underway. (The status of rehabilitation for Inga I is unclear at this time.) The rehabilitation for both dams is estimated to cost \$550 million. While the two dams are currently owned and operated by the state-owned utility, Societé Nationale d' Electricité (SNEL), it seems that at least Inga II will be (part or wholly) privatized as part of its rehabilitation. The agreement between MagEnergy and the Government of DRC remains unclear.

German-based Siemens received a World Bank contract in 2003 to participate in the rehabilitation of Inga I and II, and has set up an office in Kinshasa, but no further information is known at this time. A comprehensive rehabilitation agreement is currently being negotiated between several companies, including Eskom, Canadian-based companies MagAlloy and SNC-Lavalin, and Russian Aluminum (Rusal). Power purchase agreements are expected to be linked to the rehabilitation; MagAlloy has already negotiated to purchase 120MW from Inga II for its magnesium project in nearby Republic of Congo (RoC). Rusal is also considering building an aluminum smelter in

RoC, which would become another significant user of Inga electricity. Electricity is already exported from Inga I and II to RoC, Zambia, Zimbabwe, and South Africa. For more information, visit <http://www.irn.org/programs/congo/>.

DRC: Inga 3

In the balance

OUTSIDE INVOLVEMENT: Westcor, a consortium of 5 African utility companies, World Bank possible, China Exim possible, US Treasury possible

Inga 3 dam (3,500 MW) is considered a stepping stone to the massive Grand Inga scheme. Including its 3,000 kilometers of transmission lines, this phase is estimated to cost \$5.23 billion. In April 2006, an NGO in DRC reported that local communities would be forcibly displaced in May 2006 to make way for both Inga 3 and Grand Inga.

In October 2004, the governments and utility companies of five southern African countries – South Africa, Angola, DRC, Namibia, and Botswana – signed agreements for the Western Power Corridor (Westcor), now a registered consortium in Botswana. Westcor will develop and manage power generation and transmission of the Inga 3 dam under a Build, Own, Operate agreement. Westcor's long-term goal is developing Grand Inga, as well as proposed hydropower dams in Angola and Namibia. Each of the five utilities in the consortium has an equal stake in the company and contributed \$100,000 to fund feasibility studies for the Inga projects and transmission lines. Westcor is attempting to raise additional funds through the World Bank and other development banks, as well as private sources. The World Bank has already made several recent loans for power line upgrades and extensions from the Inga sites to various southern African destinations.

The US Treasury Department plans to finance a technical assistance program for Inga 3 by providing an advisor as part of US diplomatic staff in DRC. According to African Intelligence Online, the Treasury Department's interest stems from opportunities the project might hold for American corporations. However, the US Treasury has denied providing assistance. For more information, visit <http://www.irn.org/programs/congo/>.

DRC: Grand Inga Hydro Project, Congo River

In the balance

OUTSIDE INVOLVEMENT: ESKOM, 5 Southern African govts, Foreign companies, SNC Lavalin (Canada) conducted pre-feasibility studies

As envisioned, Grand Inga (40,000 MW) would be the largest hydropower installment in the world and purported to be capable of exporting power as far away as Europe. South African utility Eskom is very interested in the project and the World Bank has been helping to lay the groundwork by funding transmission line upgrades from the site, as well as regional power sector reforms. Little is known about the project's potential social or environmental impacts, but the costs will be huge and DRC's history of turmoil may prevent significant investment in the near term. The project has been given a price tag of as high as US\$ 50 billion (which may or may not include Inga I, II, and 3 costs). For more information, visit <http://www.irn.org/programs/congo/>.

ETHIOPIA: Tekeze Dam

Under Construction

OUTSIDE INVOLVEMENT: China Exim Bank, US (engineering design by US company Harza), France (Coyne et Bellier did environmental assessment)

This 185-meter hydro dam on a tributary of the Blue Nile is just one of several large dams the Ethiopian government intends to build in the next few years (the government has been updating a 1964 plan by the US Bureau of Reclamation, which proposed 33 irrigation and hydropower projects for the Blue Nile). Construction on the 225MW Tekeze began in 2002, with the primary contracts on the US\$224 million project being awarded to Chinese firms (this dam is just one of a number of African energy projects being built by the Chinese). China National Water Resources and Hydropower Engineering Corporation (CWHEC) will build the main concrete dam for the Ethiopian Electric and Power Cooperation (EEPCO), the public enterprise in charge of producing and distributing electricity throughout the country. The dam will produce a total output of 300MW. The government hopes it will be complete in 2007, but in February 2006, the Chinese contractor asked for an 18-month extension.

Details on the social and environmental impacts are sketchy and local critics of the project have not been identified. But the project is expected to bring about higher rates of malaria in the region. (For a Feb. 2005 article on Tekeze, see http://www.businessinafrica.net/energy_in_africa/)

Security is another concern for the 185-meter-high dam. Tekeze Dam is within range of Eritrean artillery and is considered a vulnerable target. In April 2005, Eritrean President Isayas Afewerki stated that war with Ethiopia was imminent when he spoke at a ruling party meeting. He added that the 2005-2006 national budget would be designed with war in mind. UN peacekeepers in the buffer zone have since been departing to avoid being caught in the crossfire.

ETHIOPIA: Gilgel Gibe II, Omo River

Likely

OUTSIDE INVOLVEMENT: Italy (lending), European Investment Bank (Approved March 2, 2005; see <http://www.eib.org/projects/pipeline/project.asp?pipe=1119&Country=1&Status=-1&Page=1> for an EIB status report on the loan)

In April 2005, Ethiopia and Italy signed a US\$277 million agreement to finance part of the engineering works of the Gilgel Gibe II hydroelectric power project. This project is an extension of the Gilgel Gibe I dam (a World Bank supported project that led to resettlement of about 5,000 people). The new project, which includes 385 km of overhead transmission lines, is expected to generate 420 MW. The Omo River basin is likely to be targeted for even more large dams, as it has a “technical hydropower potential” of some 35,000 MW.

ETHIOPIA: Gojeb hydropower project, Gojeb River

Under Construction

OUTSIDE INVOLVEMENT: European consultants, Middle Eastern private investors, AfDB support and EIB support likely

Coyne et Bellier (France) was leader of a consortium that produced the feasibility study, detailed design and tender documents for the 140 MW Gojeb Dam on the Gojeb River.

Lahmeyer International is also involved in the project. Coyne et Bellier also produced the feasibility studies, designs and tender documents for two other Ethiopian dams, the Tekeze and the 73 MW Tis Abay II on the Tis Issat waterfall 32km downstream of Lake Tana. Ethiopia's first Independent Power Project (IPP), the 150-MW Gojeb hydroelectric dam is in western Ethiopia (Jimma region). The \$300 million project is being developed by Mohammed International Development Research Organization & Companies (Midroc, a private investment agency from the Middle East). It was reported in December 2001, that construction of the Gojeb facility was being delayed due to the lack of a signed purchase power agreement (PPA) between Midroc and the government. Contracts: Engineering and consultancy – C&B, PB Power, Howard Humphreys (both UK). Lahmeyer (Germany) – management. Hydropower studies of Genalle, Baro and Geba river basins – Norplan and NorConsult. (Coyne et Bellier did environmental assessment)

ETHIOPIA: Baro and Karadobi Hydropower Projects

OUTSIDE INVOLVEMENT: European dam-engineering companies

The Norwegian firm NORPLAN, with Norconsult (Norway) and Lahmeyer International (Germany) in May 2004 was awarded a contract for the feasibility study of Baro (two projects on the Baro River, (a tributary of the White Nile) and pre-feasibility study of Karadobi Hydropower Projects (on Abay or Blue Nile). These projects are being studied under the Nile Basin Initiative. The preliminary estimate for Karadobi indicates a plant with an installed capacity of 1000-1600 MW. The planned installed capacity at Baro 1 is 170 MW and at Baro 2 it is 480 MW. An alternative on the Baro River for three hydropower plants is also being studied.

ETHIOPIA: Neshi Dam

In the balance

Only three companies submitted bids to the Ethiopia Electricity Power Corporation for 186 MW Neshi Dam: Turkey's Enka, Italy's Salini and the Chinese firm Gezhou Group. [so did salini get it? not clear] The Neshi river, site of the future dam, lies nearly 300 km east of Addis Ababa. It is unclear if the dam is already under construction. Salini already operates in Ethiopia. The group built the Gigel Gibe dam with funding from the European Investment Bank and the Italian government. At present, Salini is building the second section of the dam with a capacity of 428 MW.

ETHIOPIA: Kesem and Tendaho dams

The Water & Power Consultancy Services (India) Ltd has secured four projects in Ethiopia. D. Dutta, CMD, WAPCOS, signed agreements in Ethiopia for the feasibility study and detail design of both of these dams. According to news reports in 2004, agreements were also signed for the environmental study of Koga Irrigation and Watershed Management project and extension of services for Wabi Shebelle River Basin Master Plan study.

THE GAMBIA: Sambangalou Hydropower Project, River Gambia

In the balance

OUTSIDE INVOLVEMENT: European engineering firms, African Development Bank
The local newspaper reported in May 2005 that construction on this project could begin in 2006, and be commissioned by 2010. It is unclear where financing would come from. Gambia Daily News reports the Sambangalou hydropower project will cost a total of 228 million Euros, and the powerline interconnection 229 million Euros. The project would be a joint project of the Gambia River Basin Development Organisation (OMVG), comprising The Gambia, Guinea, Senegal and Guinea-Bissau.

Feasibility study on the dam and grid interlinking projects was completed by Groupement Coyne et Bellier - Tecsalt - Coba (COTECO), a consortium of consulting engineers contracted by OMVG in 2003 (with funding from the African Development Bank).

The feasibility study report mentioned "the environmental and socio-economic impacts of the Sambangalou hydropower project and possible mitigation measures", and revealed that creating a 181 km² reservoir upstream of the River Gambia will reduce the water level downstream, and the resulting low flows "will keep the saline wedge of the Gambian estuary some 100 km downstream of its usual mean location. It will thus make more than 7,000 ha of arable land (in The Gambia) free from salty water."

GHANA: Bui Dam, Black Volta River

In the balance

OUTSIDE INVOLVEMENT: Coyne et Bellier (feasibility study); Chinese Ex-Im Bank and construction company,

In November 2005, the Ghanaian government signed an MOU with the China Water Resources & Hydropower Construction Group (Sinohydro) that provided for the Chinese group to build a 400 MW dam on the Black Volta River.. Under the agreement with Sinohydro, the dam's construction will be partially funded by China's Ex-Im Bank. Ghana's government has already spent \$2 million on an environmental impact study. In April 2006 the multinational environmental consulting company ERM released information on the Environmental and Social Impact Assessment they have been contracted to complete (see

[http://www.erm.com/ERM/Svc/EIA.NSF/\(Page_Name_Web\)/Services_BuiHydroelectricESIA](http://www.erm.com/ERM/Svc/EIA.NSF/(Page_Name_Web)/Services_BuiHydroelectricESIA)).

Bui Dam has been on the books for decades (and whose hypothetical reservoir actually appears on many maps), would flood nearly a quarter of the Bui National Park, destroying habitat for rare hippos, forcibly resettling 2,600 people and affecting thousands more.

The project has had many ups and downs in its long history. In January 2005, the Executive Secretary of the Energy Commission in Ghana called on the government to revisit the Bui Dam project in order to increase Ghana's self-sufficiency and stop high tariffs. He said the country needed to spend between \$2-3 million to complete feasibility studies on the project and make it bankable to attract investors. The project could cost up to US\$700 million.

In October 2001, the dam was temporarily shelved after a public statement by the government announced that Bui Dam was not the least-cost option and could not meet immediate energy needs. "One can no longer assume that hydropower generation is cheaper anymore," said Charles Wereko-Brobby, Chief Executive of the Volta River Authority (VRA). "If you are running thermal with gas, you can run it half the cost of hydropower from Bui." In recent years, Ghana has been plagued by power rationing because of its dependence on large hydro projects.

The project previously interested a consortium made up of Halliburton, ABB Alstom Power, Dragados and Hyundai for a time. However, the cost of its electricity cited by the consortium was deemed too dear and the government dropped the idea in the 1990s.

In addition to Bui, a local journalist reports that the VRA has identified 16 potential sites for the production of hydroelectricity and that more rivers will be damned throughout the country. The World Bank is also supporting an increase in the capacity of the Akosombo Dam through a renovation of its turbines; this should increase power from the dam by 15%.

KENYA: Sondu-Miriu Dam, Sondu River Under construction

OUTSIDE INVOLVEMENT: JBIC (Japan), Konoike Construction JV with Viedekke (Norway), Murray & Roberts Contractors International (SA), Nippon Koei Company (Japan)

Sondu-Miriu is a 60 MW dam on the Sondu River that is expected to be completed in 2007, after years of delay. Affected communities have complained about the poor compensation, corruption and lack of transparency in the project. JBIC (Japanese lending agency) suspended its funding of the project in mid 2001 after significant resistance by affected communities and NGOs, but re-committed to completing the dam in November 2004. In January 2005, Kenya's Environmental Minister declared that Sondu-Miriu will be a "white elephant" if heavy deforestation continues in the watershed, as increased siltation from the eroded landscape washes into the river, shortening the life of the dam.

KENYA: Ewaso Ngiro project (aka Amala Project), Mara River Basin Unlikely

OUTSIDE INVOLVEMENT: Knight-Piesold (UK), UK Gov't Export Credits Guarantee Department

In the 1990s, the Government of Kenya proposed a cascade of three hydroelectric schemes (expected to generate 180MW of electricity) on the Ewaso Ngiro (South) River. The project would transfer water from the Amala River to the headwaters of the Ewaso Ngiro River. Since the Amala River flows southwards into Mara River which passes through the Serengeti Ecosystem and finally into Lake Victoria, this project will substantially reduce the volume of water available in the Mara River and may lead to complete drying of the river in times of severe drought. The project will severely affect the Serengeti ecosystem and the Masarua Swamp, a key water resource within Serengeti National Park. The project has caused massive controversy between Kenya and Tanzania.

Tanzania fears fragile flamingo nesting and breeding sites will be destroyed. Tanzania has twice vetoed the project.

The UK company Knight Piesold has been involved in this project since 1989. In 1992, a World Bank study team criticized a contract for feasibility studies and environmental impact assessments that the company won in 1990 for being "five times what such services would normally cost." The World Bank's report was obtained by the *Financial Times*, which reported that the UK government's ECGD had backed 85% of Knight Piesold's fee. The reputation of the client, then called Kenya Power and Lighting Corp, was already tainted by allegations of corruption. Since this scandal, Knight Piesold won further contracts for full tender design and documentation.

LESOTHO: Metolong Dam/Lowlands Water Supply Project Likely
OUTSIDE INVOLVEMENT: World Bank possible), Millennium Challenge Corp (US)
This large dam is in the feasibility stage; the US\$192 million project is intended to supplement water supply to urban center of Lesotho. Significant social impacts are likely in this densely populated region. Likely to go ahead in next several years due to increasing water demand from industry, and unmet domestic needs. Although the government believes the project could reduce unemployment by increasing jobs in factories that get water from the dam, in fact, the garment industry in Lesotho has taken a sudden downturn as garment businesses are closing shop in Lesotho as China's control over the garment trade rises.

Despite having a huge water project in its midst, Lesotho citizens still suffer from a lack of safe drinking water. Water demand has risen considerably largely in Lesotho as a result of increasing requirements by industry in urban centers. Metolong dam will supply water for various towns; the project has been targeted by the US –government's Millennium Challenge Corp., which has begun holding meetings with NGOs on the project. The Lesotho NGO, Transformation Resource Centre, which has extensively monitored the LHWP project, is also monitoring this dam, and pressing authorities not to repeat the mistakes of the LHWP dams.

LESOTHO: Mashai Dam, Phase 2 of LHWP In the balance
The next phase of the 5-dam Lesotho Highlands Water Project is now getting renewed consideration, and the South African and Lesotho governments are moving forward with project studies. For more information on the LHWP, visit <http://www.irn.org/programs/lesotho/>.

MALAWI: Pumped Storage, Lake Malawi Being studied
In December 2004, the local press reported that the government is studying the possibility of a pumped-storage project that would pump the northern part of Lake Malawi to produce up to 1,600 megawatts of electricity. A feasibility study on the project was to be started in January, and was expected to take about five months. Local utility Escom is

facilitating the work. The project could export power to countries like Tanzania, Somalia and Sudan, said the Minister of Mines, Natural Resources and Environment.

Malawi is currently almost completely dependent on hydropower, but electricity production has been reduced by about 20% because of damaged and ageing equipment, siltation and aquatic weed problems.

MALAWI: Other new dams

Kaphichira Phase 2	64 MW, planned for 2009	Being Studied
Fufu Dam	100 MW, planned for 2012	Being Studied
Kholombizo Dam	240 MW, planned for 2018	Being studied
Mpatamanga Dam	260 MW, planned for 2020	Being studied

MALI: Talo Dam

Under construction?

OUTSIDE INVOLVEMENT: African Development Bank is primary financier

Construction on this project was anticipated to begin in October 2004 after a 3 day meeting was held to present new project impact studies. Cultural Survival, who had earlier raised concerns over anticipated downstream impacts to local people, endorsed the project after the new impact studies were presented. “Though construction is likely to proceed this year there is still a lot more planning required to assure that the project is well managed as envisioned,” Larry Childs of Cultural Survival said. “Local management skills must be developed, project monitoring systems better devised, and contingency planning carried out to ensure effective responses to unforeseen negative effects that always accompany dams.” There is no further update since construction began.

<http://209.200.101.189/publications/csq/csq-article.cfm?id=27&highlight=talo%20dam>

MOROCCO: Dams on the Moulouya River

In the Balance

The *Agence du Bassin de la Moulouya* (Moulouya River Basin Agency) is in charge of a project that includes building 15 more dams on the Moulouya River over the next 25 years. Local groups are concerned that this could expose northeastern Morocco to many problems. There are two Ramsar sites in the area that will be affected by the plan. The agency has refused to give information to local NGOs.

MOZAMBIQUE: Mphanda Nkuwa Dam, Zambezi River

In the balance

OUTSIDE INVOLVEMENT: China Exim Bank, Eskom (SA), Knight-Piesold (UK)

In April 2006, the China Exim Bank agreed to fund the construction of Mphanda Nkuwa, including transmission lines, worth over US\$2 billion. Final project studies have not been released. This large hydro dam is intended for power export to South Africa and possibly to help power the huge Mozal aluminum smelter. The UK company Knight Piesold has a \$550 million contract to study the project. The project would displace 1,400 rural

farmers, and jeopardize ongoing efforts to restore the lower Zambezi to something of its historic richness. The project also poses significant economic risk to Mozambique. Mozambique's favored status in the development community and the project's strong support from NEPAD are counter-balanced by the project's dubious economic justification, environmental concerns, and a strong local NGO campaign. For more information, visit <http://www.irn.org/programs/mphanda/>.

MOZAMBIQUE: Cahora Bassa North, Zambezi River Unlikely
Additional turbines for Cahora Bassa Dam on the Zambezi River. This EIA stage project is backed by the principal owners of Cahora Bassa, the Gov't of Portugal. Severe environmental impacts and Cahora Bassa's poor financial condition make the project unlikely unless Mphanda Nkuwa goes ahead first.

MOZAMBIQUE: Rehabilitation of Massingir Dam Under rehab
OUTSIDE INVOLVEMENT: NORPLAN (Norwegian engineering co.) did the dam-rehab EIA in 1993, African Development Bank

This partly completed dam, the second largest in Mozambique, is about 4km downstream from the eastern border of the Kruger National Park (KNP). It was built in the early 1970s, in terms of an agreement between South Africa and Portugal, prior to South Africa's current environmental and water laws, to ensure irrigation to the Lower Limpopo Valley in Mozambique and to possibly supply hydropower. The Mozambican civil war hampered completion of the dam, notably the installation of the sluice gates, which are now being installed. Rehabilitation also entails restoring the dam wall to enable the dam to carry its full reservoir of 2,800 million cubic metres. The project is likely to impact the Oliphants River gorge in Kruger Natl Park. According to the Kruger Times, South African agencies (such as DWAF, Kruger and the SA Department of Environmental Affairs and Tourism) have not been consulted and have not seen the EIA. The head of Conservation Services in the KNP said that no mitigation could be done to save the Olifants River gorge: "The dam will cause massive sedimentation in the gorge, but there is no information available because no proper study has been undertaken. The sedimentation will destroy the deep pool-rapid ecosystem in the lower Olifants and Letaba rivers. Once lost this national treasure cannot be regained." This is also the largest breeding ground for the Nile Crocodile.

NAMIBIA: Popa Falls Dam, Okavango River Unlikely
This hydro dam is intended for power supply to northeastern Namibia. There has been strong interest from the Namibian government for this project, but because of its potentially disastrous impact on the Okavango Delta and its relatively small power output it is unlikely to proceed. For more information, visit <http://www.irn.org/programs/okavango/>.

NAMIBIA/ANGOLA: Epupa Dam, Cunene River Unlikely

This large hydro dam was seriously studied in the late 1990s, but has since been shelved after the project's terrible impacts on the Himba tribal people received major international attention. It was also very costly, and very far from the urban centers that would use its power. Although today the government is now pursuing a major gas project (Kudu), Epupa (and an alternate project downstream called Baynes) continues to receive occasional official mentions. For more information, visit <http://www.irn.org/programs/epupa/>.

NIGER: Kandadji Dam

In the balance

OUTSIDE INVOLVEMENT: France (EDF), FAD/African Development Fund, Germany (Lahmeyer International/feasibility studies), Islamic Development Bank (BID)

This 230-meter-high multipurpose dam (originally conceived as a hydropower project) would impound a large part of the Niger River, produce 125MW of power, provide irrigation water to a proposed 122,000 hectares, and displace some 33,500 people. The US Dept. of Energy reported in June 2003, "Niger is seeking international and multilateral donors to help in the construction of the Kandadji hydroelectric project. Kandadji, first conceived in the mid-1970s, would be located on the Niger River approximately 200 km upstream of Niamey. The government of Niger hopes to begin construction in 2004 and complete it by 2012." The 125-MW facility (originally proposed to be 230 MW) is expected to cost \$300 million.

According to a project environmental assessment prepared by the Nigerian Association of Environmental Impact Assessment Professionals,

([http://66.102.7.104/search?q=cache:Gz6_t4cFjN8J:www.ajeam-
ragee.org/getdoc.asp%3Ffpath%3Dc:%255Cdomains%255Cajeam-
ragee.org%255Cdb%255Cvol5april2003p46-54.doc+Kandadji++hydro-electric&hl=en](http://66.102.7.104/search?q=cache:Gz6_t4cFjN8J:www.ajeam-
ragee.org/getdoc.asp%3Ffpath%3Dc:%255Cdomains%255Cajeam-
ragee.org%255Cdb%255Cvol5april2003p46-54.doc+Kandadji++hydro-electric&hl=en))

"Current scientific knowledge suggests that western Niger is likely to experience increasingly frequent periods of drought with greater climatic fluctuations, accompanied by an underlying upward trend in ambient temperatures and an increase in evapo-transpiration. In such conditions, the Niger River itself is in danger of disappearing, with the environmental and socio-economic consequences that this will entail." This document presents the project as a way to mitigate the reduced flows in the river, and barely touches on the hydropower aspects of the project.

NIGERIA: Mambila hydropower dam (3,900 MW)

Likely

OUTSIDE INVOLVEMENT: China Ex-Im Bank

In October 2005, Nigeria's Federal Executive Council approved the signing of the Memoranda of Understanding between Nigeria and China over the commencement of work on the Mambila Hydro power project, which will generate 2000 MW. The total project cost is about US\$ 2.3 billion. In order to fast track the completion of the project, it is being supervised directly by the presidency. In May 2005, the China National Petroleum Corporation was awarded 4 blocks for oil exploration after agreeing to build the Mambila Dam. In April 2006, the presidents of Nigeria and China signed an MoU for oil development that included a \$500 million export credit from China for infrastructure

development. Currently, Nigeria gets about 20% of its electricity from hydropower. The site is located in northeastern Nigeria on the Mambila plateau.

NIGERIA: Zungeru Hydro Electric Dam 950 MW Likely

OUTSIDE INVOLVEMENT: Likely China Ex-Im Bank, likely Sinohydro

In April 2005, the president of the China Exim Bank affirmed the Bank's readiness to fund both Mambila and Zungeru hydro dams 100% if project details could be agreed upon. Zungeru would be located on the Kaduna River. An environmental impact study was completed on the project in 1990.

REPUBLIC OF CONGO: Imboulou Dam Under construction

OUTSIDE INVOLVEMENT: Chinese companies

Construction of the 120-MW Imboulou Dam on the Lefini River began in 2003 and is expected to take six years at a cost of US \$280 million. It is being led by a consortium of two private Chinese companies, CMEC and CIEMCO. Republic of Congo is 98% hydro-dependent. RoC imports about a quarter of its electricity from the Democratic Republic of the Congo. The Chinese-built, 74-MW Bouenza (Moukouloulou) Dam, on a tributary of the Niari River, is also undergoing restoration. It is unclear if Imboulou is completely new, as there are some reports that this dam was constructed previously. For the most recent report (in French) see: <http://www.congo-site.com/pub/fr/v4x/actualites/article.php?num=3630>

REPUBLIC OF CONGO: Sounda Gorge Dam Being Studied

OUTSIDE INVOLVEMENT: Canadian and European companies

Canadian-based MagIndustries secured an option to complete the development of the Sounda Gorge hydro project on the Kouilou River near the confluence with the Niari River, 85 km NE of Pointe-Noire. A pre-feasibility study for Sounda was completed by SNC Lavalin in 1999. MagIndustries' interest in Sounda Gorge Dam is to supply energy to its related magnesium plant. A feasibility study on the magnesium plant development was prepared by the German-based engineering firm Salzgitter Anlagenbau GmbH ("Salzgitter"), a division of Preussag of Germany. An earlier pre-feasibility study was also completed by SNC-Lavalin Inc. regarding the supporting hydroelectric project in the Sounda Gorge of the nearby Kouilou River. While earlier reports indicated the hydro site could yield a capacity of 1,000 MW at a cost of \$925 million, MagIndustries reports that SNC advises a 360MW development at a reported cost of \$360 million. The project involves three phases: two turbines providing 10 MW to generate income for the following phases; a 130-foot dam boosting capacity to 240 MW; and an increase in the height of the dam to 200 feet to yield the 1 GW capacity. There were

RWANDA/TANZANIA/BURUNDI: Rusumo Falls Dam Likely

OUTSIDE INVOLVEMENT: Nile Basin Initiative and European companies

The Ministers of Energy of Burundi, Rwanda and Tanzania met in March 2006 and agreed on the construction of the Rusumo Falls Hydro Plant on the Akagera River. The Project could produce 61 MW for the three countries. In March 2006, it was reported that government agreements on the project were reaching a conclusion, and that funding may be secured but it is unclear where the funding is coming from. The World Bank has been approached for funding, and may have funded studies. SNC-Lavalin completed a study on the project. This is a program under the Nile Basin Initiative's (NBI) Nile Equatorial Lakes Subsidiary Action Program (NELSAP). The cost is estimated at US\$ 205 million. The implementing agencies are Regideso of Burundi, and Societe Nationale de l'Energie des Grands Lacs (/SINELAC/) based in the DR Congo.

SENEGAL/MALI: Manantali/Diama Dam expansion In the balance
These completed dams in the Senegal River Basin were built for irrigation, but were so uneconomic that hydro was added to Manantali later (with World Bank support). The dams are notorious for vastly increasing water-borne disease in local populations; a renowned health expert says it created the largest epidemic of Schistosomiasis infection in Africa. Now, the Senegalese president has said he wants to double the capacity of the Manantali dam. He recommended to his counterparts from Mali and Mauritania that the organization build three secondary dams downstream from the Manantali on the Bafing, a tributary of the Senegal River. Each would have a 75 MW capacity. South African utility Eskom manages Manantali Dam, and would likely need to be on board for the new dams. It seems unlikely this would be a priority for Eskom, which is involved in operations and investments across the continent.

SENEGAL/GUINEA: Sambangalou Dam, Kaléta Dam Being studied
OUTSIDE INVOLVEMENT: African Development Fund \$5.35 million for studies
It was announced in January 2005 that the Gambia River Basin Development Organisation (OMVG) is launching a study of new hydroelectric projects in Senegal and Guinea. The "Multinational Electric Power Grids" study is being funded with the aid of a US\$5.35M grant from the African Development Fund (ADF). Two large dams are planned: the first located in Sambangalou, a village in southern Senegal at the river Gambia, the second at Kaléta, on the Konkouré river, central Guinea. The Sambangalou alone will have a capacity of 400GWh. Also included would be a regional integration of power grids in the OMVG's four member countries, The Gambia, Guinea, Guinea-Bissau and Senegal. The OMVG executes regional development projects relative to three river basins in the member countries: the River Gambia, which starts in Guinea, passes through Senegal and reaches the ocean in The Gambia; the River Géba (name in Guinea-Bissau) or Kayanga (name in Senegal), and the River Corubal (Guinea-Bissau) or Koliba (Guinea).

SOUTH AFRICA/NAMIBIA: Violsdrift and Boegoeberg dams Being studied
The Lower Orange River Management Study (LORMS) has proposed a feasibility study for possible construction of water supply dams at Violsdrift and Boegoeberg. A major

concern the study raised was the cost of construction of a Lower Orange River irrigation project that they pegged at US\$25 million, while the dams cost US\$81 million at prices estimated in April 2004. At issue is how the water and project costs would be shared by the two countries. The proposed dam would be downstream of the Vanderkloof Dam on the South African side. Because of South Africa's strong water law, feasibility of these dams would be affected by environmental flow requirements.

SOUTH AFRICA: Thukela Water Project Being studied

The Department of Water Affairs and Forestry is also considering the proposed Thukela Water Project in Kwazulu-Natal, which will consist of two new dams, Jana Dam and Mielietuin Dam, and a 120-km-long pipeline linking into the Drakensberg Pumped Storage Scheme, near Bergville, in Kwazulu-Natal. This would supply additional water to the Vaal river system through Sterkfontein dam, in the south of Mpumalanga. For project details, visit the official webpage at <http://www.dwaf.gov.za/thukela/>.

SOUTH AFRICA: Skuifraam Dam, Berg River Under construction

Large dam designed to deliver water to nearby Cape Town. Relatively little social impact, but will dam one of last free-flowing river reaches in the area. Skuifraam Action Group mounted a strong media campaign, but have now shifted focus to monitoring the project's impacts. See http://www.dams.org/news_events/media148.htm for more information on this project.

SUDAN: Merowe Dam, Nile River Under construction

OUTSIDE INVOLVEMENT: Chinese Exim Bank, European companies

Giant hydro dam on the Nile River is being funded in part by Arabian investment banks and built by Chinese and European companies. The project is displacing thousands of people and destroying a number of archaeological sites. In April 2006, violence erupted between authorities and dam-affected communities, and the situation remains tense. Five people of a displaced community were killed and dozens more wounded. For more information, visit <http://www.irn.org/programs/merowe/>.

SUDAN: Kajbar Dam In the balance

This 300 MW, 221m high dam would be sited at the second cataract on the Nile. It would be built at the heart of the remaining Nubian land, wiping out many of the remaining heritage sites and forcibly removing over 50,000 people. Ancient towns, tombs, monasteries, and forts would be lost forever without ever being thoroughly studied. (See <http://www.thenubian.net/appeal.php> for an appeal by Nubian leaders)

An agreement between Sudan and China was signed in 1997 to finance the dam. Under terms of the agreement, China would finance 75% of the project and Sudan would provide the remaining 25%. The current status of the project is unclear.

TANZANIA: Rufiji Basin projects In the balance
OUTSIDE INVOLVEMENT: European companies, World Bank
Rubada and Norconsult from Norway prepared a Rufiji Basin Hydropower Master Plan in 1984 and identified eight major hydropower potential sites as follows: Stieglers Gorge, 2100 MW; Mpanga, 165 MW; Ruhudji, 685 MW; Mnyera, 485 MW; Iringa, 87 MW; Lukose, 130 MW; Kihansi, 180 MW (operational); Kilombero (Kingenena's and Shughuli Falls), 464 MW. Stieglers Gorge hydropower project has been studied in detail. Designs of this project are available in Rubada's offices. The project was reviewed by an independent panel of experts engaged by the World Bank and found to be technically and economically feasible. Current status of projects is unclear. For more information, visit <http://www.rubada.org/>.

TANZANIA: Rumakali Dam Being Studied
As of 2005, this project was reportedly at feasibility study stage.

UGANDA: Bujagali Dam, Nile River Likely
OUTSIDE INVOLVEMENT: Aga Khan's Industrial Promotion Services, World Bank/ IFC; ESKOM, Foreign companies
Pre-construction hydro dam on the Nile has been stalled for many years due to corruption concerns, high cost, and a strong local and international NGO campaign,. Project now has a new developer, but old concerns remain. There is a history of strong World Bank - IFC support for the project. For more information, visit <http://www.irn.org/programs/bujagali/>.

UGANDA: Karuma Dam, Nile River In the balance
OUTSIDE INVOLVEMENT: NORPLAN (Norway)
This 150-200 MW dam proposed by NORPLAN has been sidelined because of government favoritism for Bujagali Dam. A 2003 NGO letter states: "Karuma appears to have fewer costs and more benefits than Bujagali. It will inundate much less land, has potential to bring development to the long-neglected North, and will not hurt Uganda's river-based tourism industry. In addition, Karuma appears to be less economically risky than Bujagali, and can be brought online more quickly and incrementally. The different hydropower options that were considered in the Acres assessment, and the economic, environmental and hydrological assumptions on which they were based, should be reconsidered in a rigorous manner."

ZAMBIA: Kafue Gorge Lower Unclear
OUTSIDE INVOLVEMENT: The China Import and Export Bank will provide 85 percent of the \$600 million
Project construction is expected to begin in 2006. In 2003, Chinese state-owned firm Sinohydro signed a memorandum for the construction of Kafue Gorge Lower dam.

According to a 2005 report from Swiss-based research group EAWAG, “China’s copper demand in the last five years has risen dramatically in the last five years. The investment into the Kafue Gorge Lower project can be seen as a strategy to sustain the mining industry in the Copperbelt.” This project is set to go ahead along an already heavily dammed river. Few environmental concerns have been raised and no local critics of the project have been identified. Kafue would have, or already has, impacts on a World Heritage Site downstream of the dam.

Project website: <http://www.zesco.co.zm/kafue-gorg.html>

ZAMBIA: Itezhi-Tezhi

Very Likely

OUTSIDE INVOLVEMENT: Export Development Bank of Iran, FARAB (Iranian company)

A 120MW power station is planned as an extension of the existing dam at Itezhi-Tezhi. Projected completion is 2008/09. Cost estimated at \$120m, including transmission line to national grid. 85% of project cost is covered by the Export Development Bank of Iran and 15% by Zambian utility, ZESCO. FARAB is contracted for the project construction.

ZAMBIA: Kariba North Rehab and Extension

For rehabilitation

European Investment Bank will likely finance rehabilitation of four of the turbines. A 150 MW extension is also planned.

ZAMBIA: Other possible dams include:

Batoka Gorge (1600mw), Devil’s Gorge (1240mw), Mpata Gorge (1000mw), Mambilima (700mw), Mobututa (300mw), Lumange Falls (60mw), Kabwelume Falls (54mw), Lusiwasi (40mw), Lunsemfwa (40mw), Kalungwishi (220 MW)

ZIMBABWE: Kariba South Extension

The Zimbabwean electric utility, ZESA, is planning to expand the Kariba South Power Station with two units of 150 MW each for a total of 300 MW increase at an estimated cost of US\$200 million. Concerns have been raised about the safety of the huge Kariba dam; it is unclear how an extension project would address this issue.

ZIMBABWE: Gwayi Shangani Dam

In the balance

OUTSIDE INVOLVEMENT: Chinese company

The Gwayi-Shangani Dam is located on the Zambezi River in Matabeleland North province. The project is intended to supply Zimbabwe’s second largest town, Bulawayo, with water as well as for irrigation. It would have significant social, environmental, and economic impacts. The Gwayi-Shangani Dam, was allocated US\$500 million by the Zimbabwe government under the Public Sector Investment Programme (PSIP) in 2003. A contract for the building of the dam on a Build-Operate-Transfer (BOT) arrangement has

been awarded to a Chinese company. The dam is part of the ambitious Matabeleland Zambezi Water Project.

ZIMBABWE: Tokwe-Mukorsi Dam

In the balance

As of April 2006, Tokwe-Mukorsi Dam is one of several large projects started more than 10 years ago in the Masvingo province that remains incomplete due to lack of funds. Construction stopped in 1999 after government failed to pay an Italian contractor, Salini Impreglio, 12 million euros. The contractor said in 2005 that they would only resume operations when government settles the arrears, a 3 000 euros a month payment for breach of contract. If completed, the dam will have a capacity of 1.8 billion cubic metres of water when full, which will make it the largest inland dam in the country.

ZIMBABWE: Bubi-Lupane Dam: in Matabeleland North

Status unknown