Lowering the Bar on Big Dams

Making a Case for WCD Compliance on African Dams

Katse Dam (Lesotho) under construction.

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International Rivers Network protects rivers and defends the rights of communities that depend on them. IRN opposes destructive dams and the development model they advance, and encourages better ways of meeting peoples needs for water, energy and protection from damaging floods.

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A confusing maze of new funds, programs, and strategies (both within Africa and from abroad) is now prioritizing large dam development as a solution to Africa's pressing needs for improved supplies of energy and water. Potentially huge amounts of money could be funnelled into African large dam projects in coming years, with the potential to greatly exceed the amounts allocated for rural electrification and water supply. Across the continent, numerous dams are being fast-tracked as priority projects, but the process by which most are prioritized and developed has been non-transparent. So who benefits? In too many places, large dams are powering multinational mining and aluminum companies with few local benefits, while the majority of citizens go without electricity.

Africa already has a sad legacy of impacts caused by existing dams: the traumatized Tonga people left high and dry by Kariba, the huge debt burden incurred for the Inga dams in DRC, increased poverty in the Lesotho Highlands, blackouts and a draining Lake Victoria caused by Uganda's heavy reliance on (poorly designed) dams, the increase in waterborne diseases in the Senegal River basin, and dessicated rivers or erratic dam-induced flooding for multitudes of downstream dwellers in many countries. In many cases, these legacy issues are being ignored while new dams are being prioritized – projects which, in many cases, could exacerbate the very same problems that earlier dams helped create. African governments and their development partners should prioritize reversing the damages from existing dams before pursuing new mega projects on Africa's rivers.

African nations have a wide range of standards for developing large dams, from virtually nothing to more elaborate policies and laws that could be used to address the environmental and social impacts of such projects. Often, the financing agencies bring their own standards (for example, the World Bank's Operational Policies). Some key players, such as the European Investment Bank (EIB) and China's Export-Import Bank, have minimal or no policies on large dams, despite investing heavily in large dams across the continent.

Why the Dam Controversy?

- An estimated 40-80 million people have been displaced by dams worldwide and millions more have been harmed by downstream changes.
- Resettlement and compensation have been wholly inadequate and communities continue to suffer from unaddressed impacts caused by dams.
- 60% of the world's rivers and their associated ecosystems are already suffering profound and often irreversible impacts from dams.
- Construction delays and cost overruns routinly cause projects to be less economically attractive than projected.
- Power generation targets are often not met, resulting in lower project revenues.
- Climate change will likely make economic performance worse and cause unmitigable social and environmental harm.

Today, a number of African nations including South Africa and Uganda have begun to discuss the implications of the World Commision on Dams (WCD) recommendations through multi-stakeholder processes. These processes are working to incorporate the WCD's recommendations into national policies. The various groups that have taken part in these processes deserve praise for their years of hard work, especially for bringing different, often opposing, parties to the table to discuss these difficult issues.

About the World Commission on Dams

Dams and Development: A New Framework for Decision-Making, the final report of the World Commission on Dams (WCD), is the most authoritative and broadly supported guidelines to be applied to dam and water projects. The WCD was established in 1998 by the World Bank and IUCN in response to growing opposition to large dams. Its mandate was to:

- review the development effectiveness of dams and assess alternatives for water resources and energy development; and
- develop internationally acceptable criteria, guidelines and standards for the planning, design, appraisal, construction, operation, monitoring and decommissioning of dams.

Even where WCD processes have gotten quite far, it's not yet clear if they will create lasting change in how energy and water projects in Africa are developed. Fast-tracked dam projects are moving forward with too little community input, too few protections for dam-affected people, and using an "uneven playing field" for evaluating the various options for meeting those needs. Projects are still being configured behind closed doors, and communities are still left in the dark till the eleventh hour. If the solar, wind and geothermal lobbies, or the rainwater harvesting movement, were as powerful as the international dam lobby, perhaps this would not be so. In the meantime, those entering into multi-stakeholder dialogues will want to discuss ways to improve the outcomes, and ensure that the processes are not being used merely to smooth the way for more large dams.

Many of the agencies now interested in building dams in Africa – the African Development Bank, Germany's GTZ, the World Bank, the European Union and a number of African governments – have already endorsed the WCD's Strategic Priorities. Yet progress in implementing these priorities has been slow. The WCD is not a check-list approach, but there are benchmarks and suggestions for better practice that must be prioritized if the process of developing water and energy projects is to be improved.

The WCD came about precisely because of the sorry legacy of past dam projects and the inability of the international financial institutions to address the serious issues they raise. Its "rights and risks" approach to project decision-making, and its seven strategic priorities and supporting principles make it an invaluable tool for Africa's energy and water planning. Below is a summary of critical areas that need to be met to fulfill the obligations outlined by the strategic priorities.

Comprehensive needs and options assessments: African governments and agencies working on energy and water development should carry out improved needs and options assessments *before* discussions on specific dam projects gain critical momentum (backed by studies, preliminary agreements and MOUs, and official interest). A transparent, participatory needs and options assessment that equally considers all options for meeting water and/or energy needs will help build public trust, and ensure that a development path has been fairly and intelligently chosen. Such processes should carefully consider the risks to local economies from over-dependence on hydropower, which plagues many African nations; work to make existing water, irrigation and energy systems more effective and sustainable, and seek to prioritize alternatives that will diversify the energy sector.

Gaining public acceptance: No dam should be built without the "demonstrable acceptance" of the affected people, and without the free, prior and informed consent of affected indigenous and tribal peoples. This should be achieved through negotiated agreements that are legally binding.

Addressing existing dams: African governments and the agencies that have supported their dam-building should prioritize the rehabilitation and upgrading of existing dams to maximize benefits. This includes addressing the outsanding legacy of social and environmental impacts to communities and providing retroactive compensation and other forms of redress to communities impacted by existing dams. Dam operations should also be modified to optimize mitigation of environmental impacts.

Sustaining rivers and livelihoods: Options assessment and decision-making around development projects should try to avoid impacts, followed by the mitigation of harm to a system. Before making a decision to build a dam, baseline information and scientific knowledge ecosystems, social and health issues should be gathered and analysed, taking into account the cumulative impacts of dams and other development projects ecosystems. Dams should release "environmental flows" to help maintain ecosystems and livelihoods, and agreements on such flows should be binding.

Recognising entitlements and sharing benefits: Adversely affected people should be the first to benefit from a project. This includes those displaced, living upstream and downstream of the dam, those living around the reservoir, and those whose lands impacted by resettlement sites. They should participate in the identification, selection, distribution and delivery of benefits. Negotiations with affected people should result in mutually agreed and legally enforceable mitigation and development provisions.

Sharing rivers for peace: Climate change poses huge risks for Africa, and could increase conflict in the region over increasingly scarce water resources. Choosing "no regrets" measures that protect natural resources upon which Africa's majority depend – rather than relying on grand plans for multiple dams to "hedge" against climate change – will result in less vulnerability and less risk for the rural poor, who are most at risk of climate change. Africa will need to greatly increase support for small-scale farmers who make up the majority of the overall population. Small–scale projects such as local rainwater harvesting structures, affordable drip irrigation and pump technologies, and water–saving farming techniques will be critical for helping African farmers adapt to a changing climate.

CASE STUDIES

A number of Africa's high-profile, large dam projects in recent years could have been improved – sometimes significantly so – by more careful planning and better implementation standards. Compliance with the WCD could have brought "added value" to these projects.

Southern Africa: Lesotho Highlands Water Project

A Lesotho Highlands village meeting to discuss problems with the project. Photo: IRN

Project Details: *This huge interbasin water–transfer scheme comprises five dams, 200 kilometers of tunnels blasted through the Maluti Mountains, and a 72 MW hydropower plant. It is one of Africa's largest infrastructure projects. The project's primary purpose is to transfer water to South Africa's industrial heartland. Two dams and the hydropower component are complete (at a cost of approximately $3.5bn). The project was spearheaded by the World Bank, with support from the EIB and numerous European export credit agencies.*

Although this project has "delivered the goods" (water to South Africa), it has left trouble in its wake. The EIB's optimistic pronouncement that it "considers that the Highland people's quality of life will be enhanced – even if they have to resettle – as a result of much improved infrastructure created by the project, re-training and other social welfare and employment creation measures, as well as compensation, on all of which they have been consulted and to which they are party"[1] reads like a cruel joke at this stage.

More than 27,500 people upstream and an estimated 152,000 Lesotho villagers living along the Senqu River below the Katse and Mohale Dams have been adversely affected to varying degrees by the LHWP, according to Thayer Scudder, a sociologist and member of the project's Panel of Experts from 1989-2002.[2] Sadly, affected people have not been made true beneficiaries of the project for which they gave up so much, and poverty has actually increased in Lesotho since ground was broken for the first dam.[3]

[1] http://www.eib.org/news/lesotho-highlands-water-project.htm
[2] *On the Wrong Side of Development: Lessons Learned from the LHWP* published by Transformation Resource Centre, Maseru, 2006.
[3] Implementation Completion for Phase 1B by the World Bank (May 2007)

(At this writing, Lesotho was in the grips of a terrible drought-induced food shortage affecting one-fifth of the population. "The last thing Lesotho needed was another poor harvest since so many vulnerable people are already living on the edge, struggling to cope with the combined impact of successive crop failures, extreme poverty and HIV/AIDS," said Amir Abdulla, World Food Program's Regional Director for Southern Africa.[4] The situation, which is expected to last through 2008, was not mitigated by having so much water impounded within its borders. The LHWP can make emergency releases to maintain urban water supply, but not for growing crops.)

While many affected people have benefited from improved roads and sanitation, too many other programs designed to help them restore their lives have failed. The World Bank states: "The impact of royalty revenues on poverty is difficult to determine."[5] The project treaty required dam-affected people to be left no worse off than when the project began, but the World Bank noted in its "project completion report" that:

- "Large components of the implementation of environmental and social programmes lag by years";
- "The GoL exhibited limited commitment to addressing the project's broader social and environmental objectives and failed to capitalize on a number of significant opportunities"; and
- monitoring and evaluation on environmental, social and poverty reduction was not carried out in a satisfactory manner. "These problems have complicated determination of project impacts on Highlands communities and the extent to which the Treaty provisions have been met."[6]

The key element to restoring livelihoods was the Rural Development Plan, which was widely criticized for years. A June 1996 World Bank report stated, "After about eight years of implementation of RDP progress, a recent evaluation shows that, although there is some potential for this program in the Highlands, it cannot be trusted to restore incomes and sources of livelihoods as required by the treaty and Bank resettlement policy." The program was eventually scrapped.

Health problems have been a particular trauma. A workforce numbering 20,000 people moved into the Highlands, bringing AIDS to the isolated communities. Today, Lesotho has one of the highest AIDS rates in Africa. More minor but still troubling health problems have arisen due to the greatly reduced flow of water to communities downstream of the dams.

Environmental Impacts: The feasibility study for the project concluded that there were no major "environmental obstacles", so the LHWP began without an environmental impact assessment. The second dam had an incomplete EIA (key issues that could affect project viability, such as erosion and sedimentation, were not covered). The World Bank completion for Phase 1B states the situation today: "Although it was originally restricted in scope, the EIA identified 140 impacts, including 29 downstream and 48 other impacts. Of these, 31 were of high significance and two of very high significance: the loss of life through HIV/AIDS and extinction

[4] FAO/WFP Crop And Food Supply Assessment Mission To Lesotho, 12 June 2007
[5] Ibid.
[6] Ibid.

of the Maluti Minnow. Failure to implement all of the measures which would have better protected the Maluti Minnow demonstrates a lack of commitment from the GoL and raises broader questions as to the long-term sustainability of many environmental measures."

An instream flow requirements study (IFR), which analyzes how much water is needed in areas downstream of a dam to support life and livelihoods, was not completed before the second dam was begun, thus greatly reducing its effectiveness. The downstream impacts of diverting most of the river's flow below the dams were found to be substantial. Adherence to the treaty requirements results in 96% reductions in river flow below Katse Dam and 57% reductions where the Senqu River flows out of Lesotho. This translates into "critically severe" biophysical and social impacts that will cost between $2.8–$4.2 million annually to address. If the entire project were built and Lesotho delivers as much water to South Africa as the original treaty requires, the IFR reports, the rivers affected by the project could deteriorate to "something akin to wastewater drains."

The World Bank completion report found that the dam operators have only complied with the IFR's policies and procedures 60% of the time. The report states: "[An audit] has identified issues likely to affect the sustainability of the IFR … The contribution of the project to the determination of environmental flows is of global significance, although long-term commitment and sustainability remain to be proven."

The devil is in the details: no matter how globally significant the report is, it cannot substitute for a commitment to protect downstream ecosystems and communities' health and well-being.

Corruption: Widespread corruption was discovered on the LHWP in 1999, when more than 12 multinational firms and consortia were found to have bribed the CEO of the project. After the CEO himself was found guilty, three major European firms have been found guilty and charged, and one (Acres International) has been debarred at the World Bank (but two years after being found guilty in a Lesotho court). According to the Lesotho Attorney General, Fine Maema, the court cases have cost the government $4.3 million as of 2004 – 2% of the country's annual budget for public services.

Improper Assessment of Need: The LHWP has failed to meet local needs for water; water supply for affected villagers has been a particular failure of the project, and drought-induced hunger has been an ongoing problem in the project area despite the presence of huge reservoirs in the Highlands.

The project was also poorly designed to meet South Africa's needs. Although many residents of Gauteng are still without a safe, adequate water supply, the LHWP's water has proved too costly to meet their needs. In part because the water was too costly for South Africa's poor, and in part because the impact of AIDS deaths meant that demand did not grow as quickly as project proponents contended it would, the project also proved to be less profitable than anticipated. The World Bank's Completion report states: "Phase 1B had a lower than expected ERR due mainly to much lower water demand growth than projected at appraisal: from 15.9% in 1998 to 11.5% in 2006. An increased allocation to environmental flows also reduced the project yield and hence the ERR. … It was clearly not anticipated that water demand

growth would decline so drastically shortly after implementation." In part due to the lower demand, some of the project's water was used to re-start mothballed dirty coal plants, according to a South African engineer.

The lower-than-expected ERR was a direct consequence of moving forward before learning the lessons of Phase 1A. At the time the second dam was approved, a high official at South Africa's Department of Water Affairs stated at a meeting (attended by IRN) that "Phase 1B could 'easily' be delayed seven years under the current state of demand management without threatening South Africa's water supply, and could be delayed up to 11 years or more with the successful implementation of new demand management strategies."[7]
A delay of as much as 18-20 years was estimated to be feasible by Rand Water conservation experts. At that time, demand projections were incomplete and the ability of demand-side management efforts to effectively put off the need for the project had not been thoroughly studied.

But World Bank staff argued against attempting demand management in order to promote Phase 1B. A 1998 paper by then task manager John Roome, titled "Economics of Delaying Phase 1B," stated: "It is not clear what the scope is for further demand management … Demand management capabilities and their impact in South Africa are theoretical and have not yet been tried and tested." Roome stated in a March 28, 1998 email to IRN that delaying Phase 1B "must be weighed against the costs of demand management that will be needed to get these delays and/or the increased risks of water restrictions" in South Africa.

LESSONS LEARNED: HOW THE LHWP COMPARES TO THE WCD

Gaining Public Acceptance

Many of the project's flawed social programs could have been avoided with greater participation by affected people. The WCD recommends: "adversely affected people should participate in the identification, selection, distribution and delivery of benefits. As a general principle, the level of benefits should be sufficient to induce demonstrable improvements in the standard of living of the affected people." This project aimed only at keeping people's living standards at existing levels, and failed to do that in too many cases. The WCD's recommendaton that all stakeholders participate "in the negotiation of outcomes that affect them" could have led to better results.

Comprehensive Options Assessment

Both phases of the project were flawed in this regard. The WCD states: "Comprehensive options assessment must precede selection of any specific development plan, whether it includes a dam or an alternative. Options considered should include institutional changes that could influence consumption patterns, reduce demand and affect the viability of supply options; [and] subsidies that can distort comparison of alternatives." It further states that "a priority should be to improve existing systems before building new supply, [and] that demand–side options should be given the same significance as supply options." The WCD also calls for a needs assessment to ensure that a project will actually meet local needs: "In countries where

[7] Personal communication.

a large proportion of the population does not have access to basic services, a key parameter should be the extent to which basic human needs will be met."

Large, "lumpy" projects such as the LHWP's big dams take so long to plan and build that reality can diverge from forecast expectations, thus increasing the risk of overbuilding. A better understanding of actual needs and the variety of ways to meet those needs was overridden in this case by the desire of the project developers to continue construction rather than allow demand-management programs to take effect.

Addressing Existing Dams

The WCD states: "Outstanding social problems associated with existing large dams are identified and assessed; processes and mechanisms are developed with affected communities to redress them. The report also highlights the need for reparations on past projects." In this case, specific conditions – including evidence for the establishment of income generating opportunities – should have been met on the first dam before advancing with Phase 1B. Structures and institutions should have been in place to prevent a repeat of the problems in Phase 1A.

Ensuring Compliance

Although institutional capacity building was a project priority and an indispensable pre-condition to successful development programs, efforts on this project – starting at initial project planning in the 1980s until today – have not created the institutional framework necessary to ensure that the environmental and social impacts of Phase 1A and 1B were satisfactorily addressed, or that the project would make a contribution to positive development for the Basotho people more broadly.

As Thayer Scudder wrote in 2006: "The range of problems raise the legitimate question as to whether the implementation issues associated with large dams in small countries like Lesotho are just too complex for realizing outcomes for affected people that are equitable and sustainable environmentally, economically, institutionally and culturally."[8] The development banks bear responsibility for this situation, not the GoU.

More specifically: a full and cumulative environmental impact assessment – including plans to address public health and social impacts – should have been carried out in a timely and participatory manner and taken into account during project design and implementation.

Recognizing Entitlements and Sharing Benefits

The Development Fund was set up by the World Bank to ensure that the LHWP was a poverty-reduction project, thereby justifying the Bank's financing. An analysis of Lesotho politics and government capacity to handle such a project might have indicated early on that simply setting up such a Fund would be insufficient to the task. Specific rules on ensuring transparency in the management of the Fund, and public information on its activities and programs should have been put in place. An independent oversight committee with the participation of civil society representatives could have helped ensure that the funds would have been allocated to benefit the population of Lesotho and in particular the affected communities in the Highlands.

[8] *On the Wrong Side of Development*

The WCD states that all recognized adversely affected people should be able to negotiate mutually agreed, formal and legally enforceable mitigation, resettlement and development entitlements. Such a plan would likely include some kind of dispute resolution, as was performed by an Ombudsman in this case, but there would be the added weight of having clear penalties for not addressing the grievances found to be legitimate. Having a local, independent advocate for communities affected by large development projects helps reveal the scope of the problem, and can minimize the chance that problems will be swept under the rug (a situation that is more likely to occur when the monitors are also part of the team responsible for resolving the problems).

The WCD report states, "Special attention is necessary to ensure that compensation and development measures are in place well in advance of resettlement. It also notes that a clear agreement with the affected people on the sequence and stages of resettlement will be required before construction on any project preparatory work begins." Resettlement, traumatic even under the best of circumstances, was unnecessarily stressful for LHWP–affected people. They received no compensation prior to displacement (a violation of World Bank policy). They were resettled to places without safe drinking water and, in some cases, have faced overt hostility from host communities. Many have yet to receive promised skills training intended to restore their livelihoods.[9]

LHWP-affected people have suffered for not having the opportunity to negotiate binding performance contracts, as recommended by the WCD. Had they been in place, resettlement sites would have been ready for habitation before people were moved. Compensation would have been paid promptly and fully. And the project authorities promises of development would either have been fulfilled or not committed to in the first place.

Sharing Rivers for Peace

The LHWP's conception gave rise to the first major conflict between South Africa and Lesotho. As described by the Swiss research body EAWAG: "In 1986, the South African government provided decisive support to the Lesotho military in its successful coup attempt. It justified the intervention by arguing that the previous government had harboured and supported anti-apartheid fighters. Within six months of the coup, Lesotho and South Africa had negotiated and signed a treaty that set in motion the LHWP. Given the significance of the treaty and the complexity of the project, it is difficult to imagine that the two governments – one brand new – could have finalized negotiations in such a short period of time without a level of discussion and agreement prior to the coup. It can be argued that one ulterior motive for supporting the coup was to secure access to Lesotho's water."[10] Then, in 1998, after unrest related to Lesotho's recent elections, South African troops moved in to "restore order" in the mountain kingdom. Katse Dam was the site of a military action that left dead and wounded in a village near the reservoir, after South African troops flew in to

[9] *Pipe Dreams: The World Bank's Failed Efforts to Restore Lives and Livelihoods of Dam-Affected People in Lesotho* by Ryan Hoover, IRN, 2001.

[10] Evaluation of Success and Failure in the International Water Management: Orange River Basin, South Africa, www.eawag.ch/research_e/apec/seminars/Case%20studies/2004/Orange_Report.pdf

prevent a takeover of the dam. Eyewitnesses reported that some Lesotho citizens had been shot in the back as they ran from the troops.[11]

South Africa: Berg Water Project

The valley flooded by the Berg River Project. Photo: Environmental Monitoring Group

Project Details: *The 70 m high Berg Water Project (BWP, previously known as Skuifraam Dam) will flood nearly 500 hectares near Cape Town when complete. Construction began in 2004 and is expected to be complete by the end of 2007. The Trans-Caledon Tunnel Authority (TCTA), a State-owned specialised liability management body, was chosen by the government to implement and fund the BWP.*

This large dam was built to increase the water supply of Cape Town, South Africa, for both urban and agricultural water supply. One key lender, the EIB, called its support for this project, "a key part of an extensive water demand management programme for the conurbation." It further stated that the dam's development, "took 14 years involving a comprehensive range of stakeholders in decisions on water demand management and efficient use of scare supplies. The evaluation of alternative options covered a wide range of criteria with a special emphasis on environmental considerations."[12]

This description does not align with the experience of the local activists who worked diligently over a number of years to slow the need for a new dam by pressing for better water conservation measures, and regularly urged a project slow-down until the World Commission on Dams had completed its work.

The project was approved by the South African water ministry in August 2000, just months before the WCD – headquartered in Cape Town – finished its final report. In February 2001, local NGOs made a last appeal, calling for a "collaborative study of the dam using the WCD Report and re-visiting whether or not we need the dam in light of the WCD recommendations… If a joint study clearly and unambiguously illustrates that the dam is indeed… the best option, then we will support it. Alternatively, if this collaborative study highlights the feasibility and true economic viability of alternatives, then these should rather be pursued. This will really

[11] Personal corerspondence. For more on the military action see: http://www.iss.co.za/Pubs/Monographs/No44/AnalysisSADC.html

[12] EIB. 2004. "EIB finances improved water supplies for Cape Town," Press Release, September 24. Available at: http://www.eib.europa.eu/news/press/press.asp?press=2843.

demonstrate to the world … the commitment of the South African Government to implementing the WCD recommendations."[13]

But the head of South Africa's Department of Water Affairs and Forestry (DWAF) rejected calls for a full review of the project, saying an internal review of the project's planning process showed it "compared favorably" with the WCD (thus ignoring a key WCD pillar, that of increased public participation and transparency). DWAF also argued that the dam was necessary to meet increasing demand and avoid economic impacts from droughts.

Yet, at the time of this dam's approval, there was clearly room for great amounts of water to be recovered through better management of water supply and water conservation. The Skuifraam Action Group (SAG), a local network of environmental groups, made a strong bid for the implementation of water conservation and demand management (WC&DM) before supply-side dam building decisions were made. At the time the dam was approved, according to SAG, some 23% of Cape Town's water was unaccounted for, and no water conservation and demand management regulations were in place. Growth in water demand exceeded growth in population by a factor of two from 1973-97. One culprit in the huge increase in water demand was watering of ornamental gardens, which account for more than a third of domestic water use in the dry season.[14]

"The approval of the Skuifraam Dam flies in the face of government policy and legislation over the past five years, and its approval comes despite the fact that the 1997 Water Act requires that alternatives to new dams be prioritized before new dams are constructed," said John Taylor of SAG. "If half of the costs of the dam were spent on WC&DM then we would not need Skuifraam for many years."

Water Conservation Option

In a 1996 speech, Kader Asmal, then South Africa's Minister for water, stated: “Skuifraam Dam on the Berg River would cost 44 cents per kilolitre of water over a 45 year period, at a discount rate of 8%. But the clearing of invading alien plants is projected to yield water at a cost of approximately 6 cents/kl over the same period at the same discount rate. That is just 14%, or about one-seventh the cost of one of the most attractive dam options. On water yield alone, clearing invading alien plants wins.”

The SAG network called on water officials to give WC&DM "the serious attention and funding needed to have a positive impact" and called for a plan that included:

- Reducing pollution of existing water sources
- Implementing rainwater harvesting
- Implementing a municipal water recycling programmes as a priority focus;
- Developing by-laws to promote water conservation through incentives;
- Increased clearing of alien vegetation in catchment areas;

[13] Letter to R. Kasrils, Minister of Water Affairs & Forestry, from Environmental Monitoring Group et al, 2 February 2001.

[14] "Objection To Skuifraam Dam Proposal" by John Taylor, 20 June 1999; and "A Constantly Thirsty City," Cape Argus, 17/02/05, http://www.capeargus.co.za/index.php?fSectionId=1594&fArticleId=2414838

- Implementing water restrictions that incorporate industry, agriculture and excessive household users together with incentive-based water reduction systems;
- Holding an aggressive and comprehensive water awareness campaign; and
- Enforcing annual water audits on industry and agriculture.

A similar program in the South African town of Hermanus achieved a 30% reduction in water use in the mid-1990s.

At the time the dam was approved, Cape Town's Environmental Monitoring Group (EMG) wrote: "A brief review of Cape Metropolitan Council policies shows that the City has no water recycling program, no by-laws on the use of grey water, no policy on the City's 400 million litres of treated sewage water (pumped out to sea), limited water education programmes, and no restrictions on water use at a time when supply is scarce. Furthermore, while in other urban centers of South Africa 'unaccounted uses' of water amount to as much as 50% of water usage, the figure for Cape Town is not known. The Council cannot even do a full analysis of how much water can be saved because they do not have sufficient water meters."[15]

Activists described the project's public participation process as one-sided and clearly not intended as an avenue to explore different options for meeting water needs. "Our experience has been that it is extremely difficult to get information without a proper platform for debate. Decisions should be based on facts, and whoever controls the facts makes the decisions… It is almost impossible for NGOs to prepare objections based upon 'hard facts' without going to extremes of expense and investigation. The proponents, on the other hand, are well funded and their consultants are paid for by the taxpayer. Surely, the best solution would be achieved if civil society were an integral part of the planning process and be allowed to inform the entire process and not merely given selected opportunities to comment upon reports that have already been prepared."

Environmental costs of the project were dismissed as "slight to moderate" in project documents. Yet, reductions in flow would affect the river's estuary. According to a Cape Province government agency: "The Lower Berg River has been proposed as a RAMSAR site. This system is of exceptional importance as a fish nursery, being one of only two permanently open river mouths in the Namaqua Marione Bio-Geographical Province. The Berg River is, therefore, regarded as being most crucial to the fish life of the West Coast. It is also regarded as being the most important *vlei* area, in terms of water bird numbers, in South Africa. More than 240 bird species (which represents more than a quarter of all bird species found in Southern Africa) have been sited on the tidal flats of the Lower Berg River."[16]

Professor Bryan Davies, then at the University of Cape Town's Department of Freshwater Ecology and one of Africa's top river experts, stated that the Berg River could not afford more water diversions as it was already under stress. EMG stated: "The Berg River estuary represents the most biologically diverse wetland on the West

[15] "Appeal To The Department Of Environmental Affairs And Tourism Regarding The Approval Of The Skuifraam Dam And Skuifraam Supplement Schemes On The Berg River In The Western Cape" by the Environmental Monitoring Group of the Western Cape

[16] http://www.capewestcoast.org/RegionalInfo/EcologyMain.htm

Coast of Southern Africa. Damming the river will significantly undermine these downstream wetlands and compromise the viability of downstream coastal fisheries. We believe that the economic information upon which the decision is based is flawed as neither the opportunity costs of the not having the Skuifraam Dam or the environmental externalities have been factored into the cost-benefit analysis."[17]

The WCD also calls for ensuring that projects will meet critical needs. The Berg River project was not necessarily going to help bring safe water supply to the region's poorest, nor help its most water-profligate residents reduce their consumption. At the time of the dam's approval, half of the water currently used in Cape Town homes is used by 20% of the households. Said EMG: "Building a new dam to ensure supply is not going to change the inequities of water use prevalent in the Western Cape. Instead, it will exacerbate the existing inequities by increasing the water tariff of everyone in Cape Town, as was experienced by the impact of the Lesotho Highlands Development Project on the communities of Alexandra and Soweto in Gauteng. This project will be operated along similar off-budget principles where users are accountable for the cost of every drop."[18]

As the project moved into implementation phase, South Africa's Department of Environmental Affairs required the builders to have an environmental monitoring committee composed of civil society representatives to help oversee environmental compliance. But there was little official support for the committee (which began as a voluntary position, but eventually included a small stipend). According to John Taylor, a member of the committee, the group "found it increasingly difficult to operate within the constraints imposed by TCTA [the dam's implementing agency]. This led to the disbanding of the committee and the loss of essential external checks and balances."

In conclusion, this project was premature, the process for choosing it ignored both civil society and the recommendations of the World Commission on Dams, and implementation was flawed and dismissive of civil society input.

Swaziland: Maguga Dam Project

Project Details: *The 115m high Maguga Dam (the fourth highest dam in Southern Africa) began in 1998 and was completed in 2002. The 870m long reservoir has a storage capacity of 332 million square metres of water.*

The Maguga Dam was intended to support commercial forestry and sugar plantations in South Africa and Swaziland, and provide irrigation for about 1,000 of Swaziland's small farmers as well. South Africa (which helped pay for the dam) receives 60% of the project's water, while Swaziland gets the rest.

[17] "Appeal To The Department Of Environmental Affairs And Tourism Regarding The Approval Of The Skuifraam Dam And Skuifraam Supplement Schemes On The Berg River In The Western Cape" by the Environmental Monitoring Group of the Western Cape
[18] Ibid.

Although from a number of standpoints this project was better managed than many other dams in Africa, it definitely could have benefited from a better analysis of how best to meet local needs for water. The majority of Swazi citizens are desperately poor, and lack essentials such as clean water, sanitation, and in many years, enough to eat. This project did not address those needs. Indeed, shortly after the dam was completed, drought hit, and for a number of years, Maguga proved ineffective in helping farmers grow enough food for the nation.

In May 2003, the UN's IRIN News reported: "Most disappointing is the new Maguga Dam, a joint Swaziland-South Africa venture that is the country's largest public works project. Opened last year…the dam was built to provide water for the nation's northwest Hhohho region, and pipe irrigation water for agricultural schemes in the parched eastern lowveld, where food shortages are most acute. 'Since it was built, the Maguga has never reached its capacity. The rains and the volume of the Komati river have not been there. Currently, the dam is only at 25 percent of capacity, and this is at the start of the dry season,' said hydrologist Sangweni."[19]

According to IRIN, the dam did not completely fill for four years, until 2006. Another drought in 2007 threatened the dam's usefulness once again. In March 2007, the Swazi Ministry of Natural Resources reported that the drought was causing the worst food shortage in 25 years. The dam's low water levels also hindered plans to produce hydroelectric power.

The project's emphasis on commercial sugar cane – one of the world's most water-intensive crops – is also a questionable use of scarce water resources in a drought-prone, food-insecure region such as Southern Africa. The US Department of Commerce has reported that the Swazi sugar industry is "composed primarily of large firms with predominantly foreign ownership. In the long run, substantial growth in Swaziland's agriculture sector is unlikely. The future of Swazi agriculture looks dim without an increase in available land and water resources."[20]

Irrigation takes up 95% of Swazi's water demand, of which 90% is used by sugar cane cultivation, mostly on large commercial plantations. Communal farmers depend on rainfall to produce most of the country's staple food, maize, and the lack of irrigation has been a major contributor to food shortages during droughts. A program to improve rainfed farmers' ability to weather drought and store rains would have better addressed this ongoing problem, and done more to alleviate poverty, than a huge dam intended for commercial interests.

Indeed, the IMF reported in 2004 that "Swaziland faces a serious socioeconomic situation. … two-thirds of the population is estimated to live on less than US$1 a day. Economic growth in Swaziland has weakened since the early 1990s." The IMF referred to economic benefits from Maguga's construction as "on-off effects."[21]

[19] http://www.irinnews.org/report.aspx?reportid=43526
[20] *World Rivers Review*, Volume 13, Number 4/August 1998, published by International Rivers Network (on-line version: http://www.irn.org/pubs/wrr/9808/newsbriefs.html).
[21] http://www.imf.org/external/np/sec/pn/2004/pn0461.htm

The project had other impacts as well. About 1,000 people were displaced. The spread of STIs/HIV/AIDS during the construction period added to affected peoples' woes. The reservoir inundated 77 000m^3 of timber – habitat that supported hundreds of species of birds, mammals and plants.

The project's support of commercial sugarcane plantations has external environmental impacts as well, such as draining wetlands for farming and converting natural habitat into monoculture timber plantations. IRIN reports: "The draining of half the wetland areas of South Africa was partly responsible for flooding in southern Mozambique that cost hundreds of people their lives in 2000 and 2001, and rendered hundreds of thousands homeless. Over the years, the upper watershed of South Africa's Limpopo River was drained for agriculture, and adjacent grasslands were defoliated due to overgrazing by cattle. Without natural vegetation and wetlands to absorb rainfall, cyclones brought flooding that flowed downstream into neighbouring Mozambique, to devastating effect."

Perhaps Swazi NGO Yonge Nawe Environmental Action Group best summed up this project's shortcomings, in a paper on large dams:

> *About 60% of the Swazi population still lives below the poverty line, while about 47% lack access to safe and clean water. Dams should therefore be relevant to the immediate needs of the rural poor. It is a cause for concern that dams in Swaziland are far from addressing the problem of food security the country is facing. What we have been seeing is a deprivation of the poor of their water resources for the benefit of agribusiness, particularly sugarcane farming, our priorities are rather skewed if one may say.*
>
> *Among all the disasters it seems the greatest is one of water mismanagement. Basic water needs are not given priority, as stated in the Water Act of 2003. A large proportion of our water resources have been dammed and channelled to sustain industries and commercial agriculture at the expense of communities.*
>
> *In fact, it is not the dams we need, it is easy access to water. We need water to curb the spread of diseases such as cholera, dysentery, typhoid and others. We need water nearby to ease the physical burden mainly on women and girls who carry water over long distances, we need water to be provided by municipalities even in the urban slums where the economically disadvantaged reside. If dams can achieve these needs, well and good.*[22]

The WCD's best-practice standards are intended to improve the likelihood that local people will benefit from large-scale infrastructure projects in their midst. The WCD states that the needs assessment process should ensure that development plans "reflect local and national needs adequately." In a country where half the population lacks safe water supply, the choice of building a dam to export large amounts of water to South Africa and sell most of the rest to commercial sugarcane farmers does not meet this WCD criteria. The Maguga project clearly would have been improved if the planning process had begun with a comprehensive and participatory assessments of

[22] http://www.yongenawe.com/03resources/newsletters/vol3iss1/vol3iss1dams.html

people's water needs and of the full range of development options for meeting these needs.

Uganda: Bujagali Dam

These women were resettled for Bujagali Dam in its first incarnation, in 2001. Their resettlement community was basically abandoned after the project's first developer left Uganda in 2002. Today, new promises are being made to affected people, but at the end of the day, will they be better off than they were before the dam? Photo by IRN.

Project Details: *The US$799 Bujagali Dam will flood Bujagali Falls, a national landmark, with its 388 ha reservoir. Construction is to begin mid-2007 and is expected to be complete by 2011. Lenders include the World Bank Group (US$360 million in loans and guarantees), the EIB (US$130 million), and the African Development Bank ($110 million). The project is being developed by Bujagali Energy, a joint venture between Kenya-based Industrial Promotion Services (IPS) and US-based Sithe Global Power, with construction by Italy's Salini.*

The Bujagali project, which was contested for years by activists in Uganda and internationally, was approved by the World Bank, EIB and African Development Bank in April-May 2007. The high-profile project has been criticized on economic grounds, for its lack of protections for endangered fisheries, its potential to harm Lake Victoria, and its inability to bring affordable power to Uganda's majority.

Bujagali's cost had doubled from the time it was first proposed until it was approved. Frank Muramuzi of Uganda's National Association of Professional Environmentalists (NAPE) says: "The project's high cost will further limit funds available for rural electrification, and will likely lead to reductions in tariff subsidies for grid-connected users. Uganda already has the most expensive power in the region, and recent tariff hikes have pushed more people out of the already limited market for electricity." An independent economist states, "The project is expected to have little or no positive impact on the majority of Ugandans now without electricity."[23] And the World Bank's own ESMAP has stated: ""No more than 7% of the total population [in Uganda] can afford unsubsidized electricity… It is unrealistic to think that more than a fraction of the rural population could be reached by a conventional, extend-the-grid approach. A more promising course is to rely instead on 'alternative,' 'non-conventional' approaches to electrification."[24]

[23] An Analysis of "Bujagali II – Economic and Financial Evaluation Study – Final Reports" by Power Planning Associates, by Pete Tsournos, March 2007. http://www.irn.org/pdf/bujagali/BujagaliEconAnalysis.pdf
[24] Uganda Energy Assessment, ESMAP, 1996. The situation has hardly changed in that time.

Hydrological Risk

The World Bank and EIB say the project will "use water that has already been used for hydroelectric generation at the upstream Nalubaale-Kiira dams on the Nile… It will contribute to improving the framework for private sector activities in the country and reducing severe disruptions of economic activities in periods of drought."[25]

In reality, the project will make Uganda more vulnerable to drought, as the dam will increase Uganda's dependence on one short stretch of the Nile for all of its electricity for some time to come. Expert hydrologists and climatologists who reviewed project reports were taken aback by the lengths taken by the various parties to downplay the project's hydrological risks. The World Bank's least-cost analysis[26] ignored extensive evidence that global warming will reduce outflows in the Nile; it also proposes a new hydrological flow pattern for operating the dam complex that could slow the recovery of Lake Victoria. The GoU's energy ministry has consistently denied operating the existing dams in a way that could harm the lake or violate the existing water agreement known as the "Agreed Curve", despite evidence to the contrary.

Independent hydrologist Daniel Kull, whose 2006 study[27] documented how the two existing dams were responsible for more than half the recent drops in Lake Victoria, says the project's hydrology analysis "starts by ignoring the true damage done to Lake Victoria by the existing dams and follows with a selective and optimistic view of current lake levels and possible climate change impacts. It is disturbing that the banks would approve a major infrastructure project based on biased hydrologic analyses." Kull believes the new hydrological regime proposed for operating all three dams could slow the rate of recovery for Lake Victoria.[28] The result could be a repeat performance of the Kiira Dam debacle, in which the World Bank used over-optimistic hydrological projections to justify that dam's projected capacity – projections which led to over-releases of water from the dam and the dropping levels of Lake Victoria. Re-using water from dams that have helped drain the Lake is small comfort; Bujagali's developers admit they will have no control over the government to ensure the Lake is protected from over-releases from the existing dams.

It is particularly amazing that the IFIs involved in this project would accept the argument that climate change will not significantly affect the Nile River flows. This is contrary to the findings of many studies that predict climate change will worsen droughts in East Africa[29], and are at odds with the World Bank's recent commitments to factor climate risk and adaptation measures into project decisions, and the EIB's statement about wanting "to support actions that will help to abate, mitigate and adapt to climate change" and to take into account "the uncertainties related to the physical effects of global warming."[30] It is hard to imagine any Northern country accepting a project that would make it almost 100% dependent upon one form of electricity that is uniquely vulnerable to climate change.

[25] http://www.eib.org/news/eib-board-of-directors-approves-financing-of-bujagali-hydroelectric-project.htm
[26] "Bujagali II – Economic and Financial Evaluation Study – Final Reports" by Power Planning Associates, commissioned by World Bank.
[27] "Connections Between Recent Water Level Drops in Lake Victoria, Dam Operations and Drought," D. Kull, 2006, available at http://www.irn.org/programs/nile/index.php?id=060208vic_pr.html
[28] Lake Victoria and The Proposed Hydrological Curve Change: New Release Regime for Bujagali Dam Would Slow Recovery of Lake (April 2007). http://www.irn.org/pdf/bujagali/BujHydrologyAnnex.pdf
[29] See, for example, http://www.nileteap.org/html/start.asp?pc=95&fn=1 and http://www.nileteap.org/html/start.asp?pc=91&fn=1
[30] "EIB and Climate Change," July 2002.

The project EIA was also flawed in analyzing the dam's impacts on fisheries. Les Kaufman, a US fisheries expert with longtime experience studying the Nile, has concluded that the existing studies are "inadequate to rule out a likelihood of negative impacts to the survival of endangered species caused by dam construction… The potential impacts to species diversity and ecosystem services from the proposed dam are extremely high."[31] He recommends additional comprehensive baseline studies, a sustainability plan for the Victoria Nile, and improved mitigation measures. It appears his concerns were ignored by the IFIs.

Dam officials' dealings with project-affected communities were very poor in the project's previous rendition, and it is unclear how their interests will be protected in the current situation. People who were moved in 2002 were not given legal title to their new lands, which caused great uncertainty. Problems that arose with the resettled communities were left unresolved for years after the original project sponsor, AES, left Uganda. It took strenuous lobbying on their behalf by local NGOs to get the government to respond to the problems. Today, the promises made to these communities have brought buy-in from many of the resettlers, but it remains to be seen if they will be better off after the project is built. As for jobs, the project construction manager estimates that between 500 and 600 local people may get jobs on the project[32]. These may be offset by those who will lose their source of livelihoods in the tourism industry, and resettlers who experience a reduction in their ability to support themselves due to the changes in their situation, as so many dam-resettlers have experienced in the past.

Alternatives Downplayed

The project studies unnecessarily minimized the potential for various alternatives (especially geothermal; its potential in Uganda was described as being one-tenth what the Ugandan energy ministry and geothermal experts believe is the true national potential) while also unfairly expecting smaller sources of power to stack up individually against a large project like Bujagali.[33]

Yet, Uganda has taken minimal efforts to develop any of the hundreds of megawatts of cleaner energy sources available to it.[34] Plugging the leaks in the transmission and distribution system would have been the natural first place to start: the national grid is estimated to leak a third of the electricity that flows into it. Uganda's large potential for microhydro has hardly been tapped. A recent article by a former *Wall Street Journal* reporter states: "Small dams capable of generating up to 15 MW are relatively inexpensive and require the hands-on involvement of villages and communities, thus potentially serving as a tool for local empowerment. Perhaps because small dams spread political and economic power, rather than concentrate it, African governments and the foreign donors who fund so much of Africa's infrastructure have generally ignored them."[35]

[31] Concerns About the Impacts of the Bujagali Dam Project On Endangered Fishes and Fisheries in the Victoria Nile, by Les Kaufman, April 2007. http://www.irn.org/pdf/bujagali/BujagaliFisheries.pdf
[32] "Bujagali Dam Works Begin," New Vision (Kampala), 4 June 2007
[33] "Bujagali II – Economic and Financial Evaluation Study" by Power Planning Associates, Feb. 2007.
[34] *Analyzing Bujagali Hydroelectric Project's Compliance with the Strategic Priorities of the World Commission on Dams* by Lori Pottinger, Feb. 2007. Available at http://www.irn.org/programs/bujagali/index.php?id=070212report.html
[35] http://www.spectrum.ieee.org/may07/5054

In March 2007, Achim Steiner, Executive Director of UNEP's Environment Programme, said the rush to build more large dams and fossil fuel plants in Africa would "lock in" the rural majority to decades without power, and called for more renewables to meet local needs. "We should not live with the dream of a trickle-down of energy supply (to villages) in 20 to 30 years time ... Africa should not follow the technological path the rest of the world is willing to give it access to," Steiner said.[36]

A national energy plan that gathered a wide range of energy alternatives could have been just as effective at meeting national energy needs, might have come online faster, cheaper and with more likelihood of meeting the needs of the unserved who are unlikely to benefit from large hydro projects, and would have helped diversify Uganda's energy economy.

Not Up to Best-Practice Standards

On March 5, 2007, NAPE and others in Uganda filed a complaint with the World Bank Inspection Panel, citing concerns about potential violations of Bank policies on Bujagali[37]. The Panel had just completed an eligibility visit when the two IFIs made their decisions to support the project. In May, the Panel was given permission to undertake a full investigation, but since the government has announced it is starting construction immediately, it is likely that the Panel's findings will be too late to greatly influence the project in key areas.

Groups have also documented the project's non-compliance with the best-practice standards described by the World Commission on Dams[38]. the Bujagali project fails to meet the WCD's standards in many key areas, including comprehensive options assessments, addressing existing dams, analyzing cumulative impacts, and others. Many areas of non-compliance with the WCD and World Bank policy should have been addressed before project approval. Examples include fully analyzing all options for meeting energy needs, undertaking a cumulative-impacts study for large dams proposed and built on the Nile, ensuring affected people are beneficiaries of the project, and addressing problems from existing dams.

Bringing the Project into WCD Compliance

The following summarizes recommendations for bringing the project into compliance with the WCD; these were sent to the EIB and World Bank in March 2007.

- A comprehensive, independently facilitated and participatory options assessment process should have taken place before the project got this far. More transparency is needed on how various options were evaluated.

- The ongoing debate over the existing dams' role in the draining of Lake Victoria should be settled in a transparent, participatory way. There is also need for an analysis of these dams' legacy of environmental damage and

[36] "Africa must set alternative energy agenda - U.N.," Reuters, 22 March 2007. http://www.alertnet.org/thenews/newsdesk/L22283521.htm

[37] This was the second time the Panel has been asked to intervene; its 2002 report's recommendations were never explicitly addressed by Bank Management.

[38] See Analyzing Bujagali Dam Against the WCD, by IRN and NAPE, http://tinyurl.com/2vjzza

disruption to the livelihoods of lakeside dwellers and businesses, and a multi-stakeholder process to come up with long-term workable solutions.

- An analysis by climate-change experts of the risks of climate change on Uganda's energy sector and its economy should be undertaken and released. (The project economic analysis, which mentions looking at several climate analyses, appears to have "cherry-picked" favored analysis on climate change that supports the project going forward.)

- Binding agreements are the only way to ensure that directly affected people are primary beneficiaries of the project. As recommended by the WCD, a plan for addressing affected peoples' needs should include benchmarks for success, an evaluation of project authorities' capacity to carry out the plan, and the use of financial guarantees, performance bonds or trust funds to ensure sufficient funds to undertake commitments to affected people. Compliance with promises on resettlement and rehabilitation would be strengthened if a truly independent monitoring body, which includes members of civil society, is created. The choice of such a body should have the participation of the affected communities.

- The final hydrological flow agreement for the dams should be subject to an independent and transparent review. Hydrological data should be released in real-time to ensure compliance with the water-release agreement. Any future agreement on water releases should include an arbitration mechanism under which violations of the agreement can be dealt with.

This project clearly had political momentum that overrode concerns about its impacts on Uganda's economy, on Lake Victoria and the Nile, and on the nation's ability to adapt to climate change. It is not too late to take more aggessive steps to addressing these concerns. The major donors to this project owe it to Uganda ensure this project does not become a white elephant, and to promote better energy planning in future.

Tanzania: Lower Kihansi Dam

The Kihansi Spray Toad was discovered only after project construction started. A thorough environmental impact assessment would likely have identified the toad and other endangered species in the area before a final project decision was made .

Project Details: *This $260mn 180 MW dam project was financed by the World Bank, EIB, and Norwegian, Swedish and German bilaterals. EIB contribution was €23,000,000 (1994). It destroyed a spectacular 800 meter high waterfall in Kihansi Gorge, and affected over 20,000 villagers.*

Putting a 25-meter-high dam in the middle of one of IUCN's 25 designated "Global Biodiversity Hotspots" would seem to indicate the need for a thorough environmental impact assessment. That was not the case with this project. A rare, endangered frog and other species were only discovered in the project area after construction had started. Once dam operators began diverting water for the project in 1999, the original flow of the Kihansi River was reduced by 75%, greatly harming the habitat of the endemic Kihansi Spray Toad and at least two endangered plant species, including a type of wild coffee that grew only in the waterfall spray zone. The spray zone of the falls turned out to be the only habitat in the world for the toad, which now is perilously close to extinct in the wild.[39]

The discovery of the rare toad during construction led NORAD (one of the financers) to undertake its own environmental review, which "found the original World Bank environmental assessment to be of such poor quality that it financed its own Environmental Impact Assessment."[40] According to NORAD, in addtion to missing critical species and leaving out other critical data, the original EIA failed to include adequate water-discharge and dam management plans.

A short-term emergency project tried to recreate the spray zone conditions with artificial sprinklers. A breeding program was also undertaken. Neither has succeeded in restoring the toad to a healthy population.

In addition to beginning work without a complete EIA, the proponents did not modify the project's design, implementation and operation after its serious impacts became apparent.

HOW KIHANSI COMPARES TO WCD

The WCD calls for policies to "maintain selected rivers with high ecosystem functions and values in their natural state." It further recommends that consideration of options places priority on "avoiding or minimizing negative impacts on endangered species" and "respecting the provisions and guidance of relevant international treaties." The WCD states that dam developers must provide "sufficient evidence to demonstrate that proposed mitigation and development measures will be effective in meeting their objectives." The growing likelihood that the LKHP will lead to the extinction of these species puts the project in violation with commitments made by Tanzania and the donor countries under the International Convention on Biological Diversity.

The WCD calls for the definition of "an environmental flow requirement to maintain downstream species, ecosystems and livelihoods" before the dam is constructed. It also states: "Releasing tailor–made environmental flows can help maintain downstream ecosystems and the communities that depend on them." No such environmental flow requirement was determined prior to construction. Since then project authorities have resisted efforts to increase downstream flows, because they claim additional releases will not allow them to produce enough power. The project feasibility study only analyzed impacts on habitat flooded by the reservoir. The report failed to mention any impacts on the Kihansi Gorge ecosystem.

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[39] http://news.mongabay.com/2005/0606-Kihansi_Spray_Toad.html
[40] http://www.power-technology.com/projects/kihansi/