

# WORLD RIVERS

# REVIEW

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## Hydro Industry Seeks to Weaken Standards

by Peter Bosshard

For decades, communities affected by projects such as dams, mines or pipelines were asked to trust the good intentions and promises of project developers. This voluntary approach resulted in a legacy of broken promises, environmental degradation, corruption, conflict, and development disasters.

Like dam investors and contractors, affected communities can't just rely on promises to safeguard their interests. They need legally enforceable rights. For more than 20 years, civil society networks have promoted binding policies and standards which safeguard the rights of affected people and the environment. Their struggles resulted in policies and conventions which

(among other things) defined the right of indigenous peoples to "free, prior, informed consent," enshrined the right of displaced people to land-for-land compensation, safeguarded labor rights, and preserved ecological no-go areas. The dam industry is now trying to roll back this progress.

### The gold standard...

The World Commission on Dams (WCD) strongly embraced a rights-based approach to dam building. The Commission's report found in 2000 that "an approach based on the recognition of rights and assessment of risks can lay the basis for greatly improved and significantly more legitimate decision-making on water and energy develop-

ment. This is an effective way to determine who has a legitimate place at the negotiation table and what issues need to be included on the agenda." The WCD report empowered affected communities to be not just passive victims of development projects, but actors at the negotiating table.

The dam industry was never happy with the WCD's rights-based approach. Together with a few governments, financial institutions and conservation organizations, the International Hydropower Association in 2007 created the Hydropower Sustainability Assessment Forum (HSAF) to come up with a new approach. The official goal of this forum is to "develop a broadly endorsed sustainability assessment tool to measure and guide performance in the hydropower sector" by the end of 2009.

HSAF is preparing a new Sustainability Assessment Protocol with guidelines on more than 80 aspects of dam projects. Each aspect will be elaborated through a list of criteria. HSAF proposes that dams be scored according to these criteria in order to decide whether or not projects can be considered sustainable. The dam industry hopes that it will be able to attract public subsidies and carbon credits for dams that pass an HSAF scorecard.

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Protesting Nam Theun 2 Dam in Laos, Day of Action, 2007. A proposed scoring system for dams would allow destructive projects in repressive regimes to move forward with little debate and no transparency.

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# Commentary

## A RIVER OF HOPE



Patrick and Sarah

**“To the people of poor nations, we pledge to work alongside you to make your farms flourish and let clean waters flow; to nourish starved bodies and feed hungry minds. And to those nations like ours that enjoy relative plenty, we say we can no longer afford indifference to suffering outside our borders; nor can we consume the world’s resources without regard to effect. For the world has changed, and we must change with it.”**

*President Barack Obama, January 20, 2009*

I’ve devoted the two decades of my professional life to acting on my belief that we in wealthy countries should not tolerate indifference to suffering elsewhere, and that our over-consumption of resources is one reason for this suffering. I never thought that a US president would share this belief and, even less likely, refer to it in

what was probably one of the most watched speeches in the history of the world.

How wonderful it would be if the “Obama Doctrine” could come to mean the acceptance of a responsibility to reduce inequality, and a responsibility to stop over-consumption and pollution. (Not to mention a responsibility to “let clean waters flow” by stopping new dams and removing old ones ...)

I watched Obama’s inauguration speech on a big screen in a church hall on Capitol Hill, maybe a third of a mile from where the new president took his oath. Along with my wife and two-year-old son Liam, I’d traveled across the country from San Francisco to be part of the historic event. We tried to get to the Mall to see the ceremony but Liam seemed likely to go hypothermic if we stayed out in the biting cold, so we took shelter in the warm and welcoming St. Mark’s Episcopal Church.

We shared our table in the church hall with several elderly African-American women from Chicago who had spent a sleepless night on a bus and been out in the cold since five in the morning. They had walked for miles from where their coach parked and finally sat down on the sidewalk, too cold and exhausted to make it to the Mall. Thankfully, someone from St. Mark’s found them and directed them to the church.

Before coming to Washington I thought I understood how much Obama’s election meant to the African-American community, but I don’t think I could fully comprehend it until actually being surrounded by the sea of tears, pride and joy that washed over DC for a few days this January.

We cried, in that comforting church, on the freezing Mall, and in living rooms and workplaces throughout the US and beyond, for the centuries of suffering endured by Black America, for the great harm caused by George Bush, for the joy that maybe a better world is indeed possible. Already we are seeing signs that some of these hopes will be realized. President Obama’s executive orders and statements on energy, climate change, labor rights and government transparency in particular bode well.

Of course we must be realistic. No individual can save the world. Greed, bigotry, selfishness, ignorance and corruption have not suddenly been banished from Washington, never mind the rest of the world. But the campaign slogan is true, Obama has brought hope, and hope is essential to inspire people to create change.

As Obama has repeatedly reminded us, his administration alone cannot bring the changes we need. Just as it required an incredible grassroots mobilization to get him elected, it will require the efforts of a movement of many millions of engaged citizens to ensure that positive change happens.

In our own work, we’ve always known that it requires a movement to stop the destruction of the world’s rivers, and we have put a lot of our resources into nurturing this movement, providing information and analysis and small amounts of funding, and forging links across the continents.

Many times the forces destroying rivers appear just too powerful to be turned back by the pro-river activists scattered around the globe. But as Obama’s victory has reminded us, movements can prevail against extraordinary odds. With courage, commitment, leadership, truth and hope, we can better the world. Sometimes, as Irish poet Seamus Heaney has said, hope and history can indeed rhyme.

Patrick McCully

# MAKING WAVES

## In the News

“A key question from environmentalists, led by the US-based group International Rivers, is whether projects meet the CDM test of ‘additionality’ – that they contribute to making real reductions of greenhouse gases rather than be business-as-usual projects capitalizing belatedly on the CDM bonanza. At Xiaoxi, where the dam should be operating by 2010, construction began in 2004, two years before the developers applied for CDM credits, suggesting it would have been built without CDM money.”

from “China dams reveal flaws in climate-change weapon,”  
Associated Press, January 25, 2009

“Nobody is claiming that there is direct proof that Zipingpu triggered the earthquake,” said Peter Bosshard, policy director of environmental advocacy group International Rivers, which is a critic of many dam projects. “But there is disturbing scientific evidence based on the limited evidence available. That makes it all the more important that Chinese authorities make all the data available.”

from “Giant Dam May Have Triggered Sichuan Quake,”  
the *Wall Street Journal*, February 6, 2009

## On the Web

International Rivers has launched two new online resources. “Tools for Educators” ([www.internationalrivers.org/en/node/3750](http://www.internationalrivers.org/en/node/3750)) is a collection of lesson plans, videos, books, and tips for teaching almost everything related to rivers, at any level. And a page on reservoir-induced seismicity ([www.internationalrivers.org/en/taxonomy/term/842](http://www.internationalrivers.org/en/taxonomy/term/842)) describes how dams trigger earthquakes (see pp. 8-9, this issue, for more on this topic).

### Another Water World is Possible

Some 25 Turkish and international groups are organizing an Alternative Water Forum to counter the pro-dam, pro-privatization agenda of the fifth World Water Forum, the world’s biggest gathering on water issues, being held in Istanbul March 16-22. The alternative forum will focus on problems with the current approach to water management, and promote awareness about more sustainable and just ways to manage and supply water. Groups from around the world have organized workshops on topics such as energy, climate change and health. **More info:** [www.alternatifsuforumu.org/en](http://www.alternatifsuforumu.org/en)



Some 1,700 activists at the World Social Forum in Belem, Brazil last month formed a human banner visible from the air to call attention to the urgent need to stop widespread destruction of the Amazon, the world’s largest rainforest. The majority were Amazonian indigenous people in full headdress, body paint, colorful feathered headdresses with their spears, bow and arrows pointed to the sky. The action was organized by Amazon Watch. Photo: Lou Dematteis/Spectal Q

## CDMWatch Restarted

Last month, CDMWatch awakened after a several years of hibernation to resume monitoring the world’s largest carbon offset program, called the Clean Development Mechanism (CDM). A group of seven NGOs, including International Rivers, restarted the watchdog organization to play a counterweight to industry pressure, which is pushing for unlimited access to cheap carbon credits through the CDM as a way to meet their emissions reduction requirements. International Rivers’ monitoring work shows that a large majority of credits being generated by the CDM are for projects that do not actually reduce emissions. The CDM is subsidizing business-as-usual projects, one-quarter of which are hydropower projects, while allowing industrialized countries to buy their way out of their emissions reduction obligations by purchasing carbon credits that don’t actually reduce emissions. CDMWatch will play an important role monitoring the CDM’s approval processes and projects, and bring a much-needed NGO voice to discussions about what form the CDM will take in the post-Kyoto Protocol climate change agreement.

Barbara Haya

# Interview

## Less is More: Energy Efficiency Lessons from California

California has one of the world's largest and most efficient economies. The numbers are impressive: the state saved nearly \$56 billion in energy costs between 1972 and 2006 through efficiency measures. It now uses 40% less electricity per person than the national average, and it generates 68% more gross domestic product for every unit of energy used than the rest of the nation. In addition to cutting pollution, this major efficiency rollout has helped the economy grow, and is credited for creating up to 1.5 million jobs. We talked to John Wilson, who has worked on reducing energy use in the state for more than 30 years – first with the California Energy Commission, and now with the nonprofit Energy Foundation – to learn more.

### **WRR: Are we approaching the limit of “how low we can go” or is there still plenty of room for efficiency in California’s economy?**

**JW:** One of the most impressive things I’ve seen in all my years in the energy field is that the more we dig for new energy-efficiency potential, the more we find. For many years we’ve had analysts looking at the cost of efficiency measures, the amount of the savings, and every time we find the potential is growing – we’re not using it up.

One of the areas where we see a lot of opportunity for efficiency improvements is in home electronics – flat-screen TVs, DVD players, home gaming systems and the like. The typical California home-entertainment system uses more electricity than the average new home uses for air conditioning. Air conditioners used to be one of the bigger uses of electricity in the state, but today air conditioning uses one-third of the electricity compared to the 1970s, thanks to appliance standards and better buildings. The good news is that we are now finding ways to make home electronics more efficient. It’s a never-ending cycle, this efficiency business.

### **WRR: California is the world’s sixth largest economy today. How has its economy been affected by its reduction in energy use? Have our utilities suffered if they have less energy to sell? What about jobs in the energy sector – have they grown or shrunk?**

**JW:** Global shifts in manufacturing have affected California’s use of energy, and the US more broadly, as heavy industry has moved elsewhere. But California has remained very prosperous, and has gained jobs in the high-tech sector, which also uses a lot of energy. Data centers are especially energy-intensive. Fortunately, the same people who brought us data centers are very good engineers, and they are continually looking for ways to improve their efficiency. Google, for example, has some of the biggest data centers on the planet, and they have a team dedicated to making their facilities more efficient.

Regulatory policies in California made sure that utilities aren’t punished for selling less energy. As for a jobs shift in the energy sector, as we’ve built fewer power plants it means fewer construction jobs, but as recent studies have shown, cutting energy bills let us spend money on other things, and created jobs in other areas.

### **WRR: Has there been a consistent theme in your years of monitoring energy efficiency?**

**JW:** The biggest lesson was that it is possible to make big changes in how energy is used, but that it takes a long time, and a lot of separate programs and policies, to get it done. There are no quick fixes to solve this puzzle; it takes a lot of patience. But the consistent and aggressive application of efficiency measures over time can have a huge impact.



John Wilson and Monti Aguirre (International Rivers) at a public forum to discuss dams, human rights and energy efficiency, in Manabi, Ecuador, 2008. Photo: Matt Terry

### **WRR: What are the key lessons of the California experience that can carry over to smaller economies in the global South? What are the first things you recommend developing countries do to improve efficiency?**

**JW:** The two most important things any country can do are efficiency standards for buildings and for appliances. Both are easy to do, especially appliance standards. There’s a big temptation for poorer nations to look for the cheapest appliances rather than efficient ones, especially for people who are getting their first refrigerators and air conditioners, but it’s a false economy. A cheap, inefficient refrigerator will cost more over the life of the product due to higher electricity bills, for example.

It’s also critical to involve the utilities in promoting efficiency. To do that, their profits must be “decoupled” from sales, which is an easy ratemaking policy to implement, but runs contrary to most business practices that say greater sales equal greater profits. The next step is to have a “public goods charge” which is a small fee on the price of electricity, typically about two percent, that creates a fund to support efficiency programs and renewable energy.

I’ve visited developing countries where the majority of the staff in the energy ministry were hydropower engineers who knew how to build dams, but next to nothing about managing demand. You need both kinds of experts – demand and supply – to bring rational planning to the energy sector.

*Continued on page 15*

# South Africa's Elusive Negawatts

by Terri Hathaway



Since 2006, South Africa's energy crisis has dealt a serious blow to Africa's largest economy, cutting off big industries and energy-importing neighbors, and derailing planned investments. At times, the shortage has plunged the country into darkness. The shortage will be a reality for the next five years, if not longer, according to government sources. South Africa must urgently find 3,000 MW to stabilize its electricity supply system just to tackle the current shortage.

One organization says they know where the cheapest power can be found. "South Africa could save 3,000 MW in the next four years by making the existing system more efficient," says Mark Borchers, Director of Sustainable Energy Africa (SEA), a Cape Town group working to raise capacity on clean energy at the local and national level. According to Borchers, filling the gap through energy efficiency could cost less than a fifth the price tag for new coal-fired power plants.

An upcoming report by SEA paints a clear path for South Africa to embrace energy efficiency. "Not only is it possible, it can save us money," says Borchers. "Ignoring it is going to be a very costly choice for the country."

According to SEA's report, efficiency is the cheapest, quickest way to relieve the current electricity shortage. A new coal-fired station costs about US\$1.6 million per megawatt (MW), not including decommissioning or externality costs. Efficiency measures would cost on the order of 15-20% of such "new build" options, resulting in \$343,000 saved per MW.

Direct savings aren't the only benefit, according to SEA. Energy efficiency helps create new jobs and maintain existing ones in both the energy sector and the greater economy, because money saved on reduced energy consumption can be spent elsewhere. The SEA report cites an Australian study's findings that energy efficiency would support as much as eight times the number of direct jobs per unit of energy compared with coal mining and power generation. In South Africa, 1,000 youths have already been trained in energy efficiency jobs through a joint government-NGO initiative. Programs to train energy auditors and contractors (to install insulation, low-flow shower heads, lighting and solar water heating) can and should be intensified, SEA says.

## What's the hold up?

South Africa has made some strides toward energy efficiency. It implemented a national energy efficiency strategy in 2005 and established a national agency in 2006. South Africa's power utility, Eskom, has for years touted its Demand Side Management (DSM) program, which includes energy efficiency.

But SEA believes much more must be done, and soon. In the last fiscal year, Eskom committed just \$56 million to DSM. "Even at its best, Eskom's commitment to DSM programs is less than 1% of its annual new-build budget," says Borchers. SEA's report found that South Africa has achieved only a 2% reduction in energy use since load shedding began, not the 10% reduction needed to stabilize the situation. "Given the economic case for energy efficiency, the technical and management options readily available, the seriousness of the power crisis we face, and the amount of time the national energy efficiency strategy and Eskom's DSM program have been in existence, this is a significant under-achievement," concludes the report.

Eskom says it plans to spend more than \$33.5 billion over the next five years on new and upgraded power supply projects.

Some analysts believe this could easily escalate by \$10 billion or more in the difficult global credit market. South Africa's treasury recently agreed to provide guarantees for World Bank and African Development Bank loans to Eskom, which have approved loans in the unprecedented amounts of \$5 billion and up to \$1.5 billion, respectively. While specific projects have not yet been identified, the loans will likely support multiple coal and other new power stations outlined in Eskom's five-year program. It's not clear whether any funds could be used to expand Eskom's DSM program, which has historically received just a fraction of the utility's "new build" budget over the past few years.

South Africa's Eskom represents nearly half of Africa's electricity market and 80% of southern Africa's. Effects of the country's energy decisions ripple beyond its borders, paving the way for new hydro and other power plants. But many energy activists in the region hope to leverage the current energy crisis as an opportunity to introduce more progressive, national- and utility-level energy decisions that strive to make energy consumption more efficient.

Eskom aside, the South African government may be starting to pay attention. In its latest budget released in February, allocations for energy efficiency programs and institutions were significantly increased. Borchers is optimistic that energy efficiency is gaining momentum. "We are really pleased with the attention energy efficiency received in the current budget, especially because much of it will go directly to local municipalities to implement." Companies that have installed equipment to improve their energy efficiency can recover up to 15% of their costs. A new tax on incandescent lighting is being introduced in an attempt to encourage consumers to switch to energy-efficient bulbs.

## Where to start?

SEA's report identifies eight recommendations for the country to embrace energy efficiency. The first is raising the price of South Africa's ultra-cheap electricity. Even after a 13% tariff increase last year, South Africa still sells some of the world's cheapest electricity, giving industries and households little reason to turn off the lights. "We have to send the right price signals to consumers to make efficiency measures work," says Borchers. "We want tariffs that hit heavy industrial and household users, not the poor. So the tariff structure has to be smart enough to protect low-income users, but make inefficiency by heavy users hit their pockets."

Pricing must also be restructured to separate Eskom's profits from the amount of electricity that it sells. This process, known as "decoupling," may require very small rate increases to offset reduced sales. In the US, decoupling has not resulted in any significant rate increases, and has led to more stable electricity prices.

"We recognize that for utilities such as Eskom, the financial bottom line will remain the dominant influence in their decision-making, so from their perspective the resistance to reducing electricity sales through efficiency initiatives may be understandable," Borchers says. "But through carefully designed mechanisms such as decoupling, it can actually be more financially beneficial for them to invest in efficiency rather than new build. So it's a win-win – the utility preserves their bottom line and the country has implemented an economically sensible efficiency program."

Other SEA recommendations include increased budgets for existing energy efficiency programs, developing training programs for new jobs, and retrofitting public buildings. Government officials

*Continued on page 14*

# Another African Lake on the Endangered List

## Ethiopian Dam Endangers Kenya's Lake Turkana

By Ikal Angelei

Lake Turkana is a miraculous anomaly of life-giving water in a parched and unforgiving land. Formed millions of years ago in the tectonic upheavals that created East Africa's Great Rift Valley, Turkana is the largest permanent desert lake in the world. Extinct volcanoes enclose the horizon, and the heat is so intense that when the blustery wind from Mount Kulal on the eastern shore temporarily ceases and clouds gather overhead, raindrops sometimes evaporate before they even reach the lake. It is called "ghost rain."

This other-worldly scene is bolstered by the world's largest population of Nile crocodiles which survive on another Nilotic ancestor, the giant perch, which in turn feeds on a profusion of blue-green algae. This prehistoric lake has also long been a focus for humans: its shores have revealed the oldest-known fossil remains of *Homo habilis*. Today, more than a quarter million residents from at least ten tribes have become masters of wresting sustenance from the harsh landscape. Without the lake, life here would be virtually impossible.

But Lake Turkana and its inhabitants now face an environmental catastrophe – and an avoidable one. The lake could start drying up when its main source, the Omo River, is depleted by a huge dam across the border in Ethiopia. The Ethiopian government is planning a series of upstream dams on the Omo River; the most imminent is the Gibe III hydroelectric dam, already two years into construction.

There is no question that Ethiopia needs power. But the irony of the Gibe III dam is that while it threatens the economy of the Turkana region, a large share of its electricity will be sold to consumers in other parts of Kenya. For Ethiopia, the project is a commercial one: they want to make money selling the power elsewhere, not provide power to their own people. For Kenya, it's a matter of allowing one part of the country to be devastated so that others may get a little more power.

The assault on the Omo River and Lake Turkana by the Gibe dam is projected to result in a drop of seven to ten meters in the lake's depth in the first five years alone (the lake has already receded by about five to eight meters because of climate change). Resulting changes in the chemical balance of the water threatens the region's tremendous biodiversity, including large populations of Nile crocodiles, hippopotamus, and over 40 different species of

fish and snakes. The riparian forest, one of the last pristine dryland forests in Africa, would also be in grave danger.

The saga of Gibe III Dam is just the latest episode of human pressures contributing to the dying of Africa's biggest lakes. Lake Chad has nearly disappeared from diversions that stopped its flow, and Lake Victoria has seen major drops in its water levels from dams that let too much water out. Climate change could add several more to the list of dead or dying lakes and depleted rivers across the continent. Losing our precious water resources will severely limit our ability to adapt to climate change.

### Endangered People

Turkana's indigenous communities are highly dependent on the lake for their food crops, livestock grazing and watering, and fishing. Any impacts to the lake's ecosystem would disrupt the economy, leading to an increase in conflicts in the area. Considering the unstable state of peace in Northern Kenya, such damage to the local economies would invoke a threat to regional stability.

While a power purchase agreement outlining the terms of electricity sales was reportedly signed between Ethiopia and Kenya in 2006, no bilateral agreements on the use of the Omo-Turkana waterway and the dam's downstream effects to Kenya have been made public. The 300,000 people who live around Lake Turkana in Kenya were neither informed of the project's impacts nor consulted on their priorities. Their situation mirrors that in Ethiopia, where the traditional economy of the Lower Omo Valley supports up to half a million people. The Ethiopian dam-affected people – who, like those on the Kenyan side, are largely indigenous peoples leading traditional lifestyles – have heard little or nothing about the project and their options, even though the changes to the Omo will upset the fragile balance of river bank cultivation and herding they maintain, unraveling the valley's best strategy against food insecurity. Resulting scarcity could quickly lead to violent conflict in one of the most culturally diverse areas of Africa.

Even if Ethiopia's affected communities organize to object to the plans, the government is notoriously unsympathetic to citizen concerns. In Ethiopia, civil society activists who might normally help raise awareness about such projects or advocate for affected people have been hesitant to join the fray, given their government's restrictive policies and repressive tendencies regarding NGOs.

The financial backers of the Gibe III Dam may include the African Development Bank, the European Investment Bank, the Italian Government and JP Morgan Chase. While the World Bank has refused to consider project funding, they may still consider financial support through loan guarantees. Agence Française de Développement, Germany's aid agency KfW, and the Development Bank of Southern Africa may support the costly transmission line from the Gibe III Dam to Kenya's national grid.

While such funders require an Environmental Impact Assessment, the one that has been submitted is incredibly sloppy and hopelessly incomplete. Shockingly, it does not even mention that the Omo River supplies almost 80% of Lake Turkana waters. It suggests that the dam will regulate the natural flooding cycle of the Omo River, eliminating the seasonal floods critical to downstream farmers. The truncated, artificial flood suggested in the EIA is ill-designed to achieve its purpose. The minimum environmental flow is based on the single, lowest monthly flow recorded in the driest month, since



Gathering water at Lake Turkana. Photo: Ikal Angelei

*Continued opposite*

# Amazon Indians Rebel Against Dams

by Glenn Switkes

**B**razil's Enawene Nawe Indians have said enough is enough to destructive development projects, and have demanded that dam construction on the Juruena River in the western Amazon come to a halt. On October 11, about 120 Indians burned the Telegráfica Dam work site in Sapezal, Mato Grosso. The project is part of the Brazilian government's Growth Acceleration Plan, and is being built by a consortium that purchased the project from the Maggi Energy company. This company is linked to soy king Blairo Maggi, now governor of Mato Grosso state. Eight of the 11 projects being planned for the Juruena have received a go-ahead from Mato Grosso environmental authorities.

No prior consultation took place with indigenous peoples who depend on the fish and other resources of the Juruena basin for their survival. The indigenous people became incensed when they learned at a meeting with indigenous protection officials that more than 80 prospective dam sites on the Juruena are being evaluated, including sites close to the Enawene Nawe reserve. The projects are relatively small, ranging in size from seven to 24 meters in height, but their impact on fisheries could be large due to the number of obstructions the dams will pose, and the poor record of fish passage devices in the tropics.

After failed attempts to negotiate a compensation package with the companies, the Enawene Nawe blocked roads, occupied the dams' work sites, and called for independent studies on the dams' impacts. Daliaywacê Enawenê Nawê, a tribal leader, said there will be no more negotiations, since money won't bring back fish and clean water once the dams are built: "The river is a very strong spirit that eats a lot of fish and drinks a lot of water in our rituals. If all these dams are built on the Juruena, he will be angry and hungry and will bring sickness to our people."

The Enawene Nawe only eat meat on special occasions. Fish is their most important food, and fundamental to their rituals. At the close of the rainy season, the men set off for collective fishing



**The Enawene Nawe are skilled fishers, and fish are their primary protein source.**  
Photo: Fiona Watson/Survival

additional technical opinions have documented serious flaws in the project studies.

There has been an explosion of investments in small dams in Brazil in recent years, and particularly in Mato Grosso. The boom is driven by government policies providing easy credit, exemptions on requirements for royalties and taxes, and other public subsidies. The licensing process has also been streamlined to permit fast-tracking of projects. Today, 39 small hydroelectric dams are in operation in the state, another 36 are in licensing or construction, and at least 80 more are being planned. While small dams usually cause less serious impacts than larger dams, the impacts of building multiple dams on a river system have not been assessed.

In November, Brazilian government officials signed an agreement with indigenous representatives who traveled to Brasilia, stipulating that no dams will be built until further studies are carried out. But since then, conflicts have continued, and indigenous people report that dam workers and security guards have beaten indigenous families fishing along the river. ●

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For more information: [www.survival-international.org/](http://www.survival-international.org/)

## Lake Turkana *continued*

1964. There is no mention of how long it may take to fill Gibe III's massive reservoir, during which time dam operators may only release 25m<sup>3</sup>/sec, creating a prolonged dry season up to several years long. Ironically, while the filling of the reservoir alone could drive Lake Turkana to the brink of ecological collapse, the EIA argues that the dam will help restore Lake Turkana, not deplete it. So far, the project has continued despite the huge deficiencies in this official study, but those concerned about the impacts on Lake Turkana intend to bring their case to these agencies.

The project's lack of transparency in other areas borders on the corrupt. The US\$1.7 billion project is the single largest infrastructure work being undertaken in Ethiopia, yet its lucrative contract was handed to Italian construction giant Salini, based on a questionable exception to Ethiopia's own procurement rules. The uncompetitive awarding of the contract also contradicts World Bank and African Development Bank procurement guidelines. The World Bank has declared the project ineligible for project lend-

ing, unlike the African Development Bank, which says it plans to consider the project despite the contract violation.

But this case is not just the responsibility of outside agencies and the Ethiopian dam planners. The Kenyan government must first and foremost do more to protect the interests of the peoples of northwest Kenya, and the ecosystems upon which they depend. The power purchase agreement with the Ethiopian government needs to be made public. We need to know if the impact on Lake Turkana was even considered before the power purchase agreement was signed. The ministries of Energy, Water, and Northern Kenya must account for their plans to preserve the environment and livelihoods of the region. The members of parliament representing Northern Kenya need to know what is planned, and have a chance to voice their communities' concerns. The peoples of Lake Turkana must be heard. ●

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# A Faultline Runs Through It

## A Look at

It is well established that large dams can trigger earthquakes. But recent news coverage linking last year's devastating earthquake in China year to the filling of a reservoir sent tremors through the dam-building industry, and sparked controversy over the little-studied phenomenon of "reservoir-induced seismicity" (RIS).

Scientists believe that reservoirs increase pressure on and lubricate faults that have been prevented from slipping by the friction of the rock surfaces. Although scientists are unable to definitively link a particular quake to a dam, many who study the problem recommend abiding by the "precautionary principle" to be on the safe side. One of the world's top experts on RIS, Leonardo Seeber, a seismologist with Columbia University's Lamont-Doherty Earth Observatory, recently told us, "My position is that earthquake hazard needs to be put on the table for a comprehensive evaluation and informed public decision. My experience, however, is that it is often minimized or neglected when public support for a project is sought."

Clarence Allen, a seismologist from the California Institute of Technology, wrote in 1982 that "our degree of understanding of reservoir-induced earthquakes is so minimal that almost no new reservoir anywhere in the world can be declared free of this possible danger," and said that "any new dam that will impound water to depths exceeding 80-100m must be designed with the assumption that a magnitude 6.5 earthquake could occur nearby."

International Rivers is calling for more transparency on this issue, and for thorough seismic assessments aired in the public sphere before more dams are built in earthquake-prone areas. Here we show some of the more prominent incidents of RIS.



### CANADA

**Sainte-Marguerite-3:** The dam created a reservoir that was up to 120 meters deep. Although in a weakly seismic area, a number of reservoir-induced earthquakes occurred on at least five occasions.

### U.S.

**California:** Crowley, 1941, M6.0; Shasta, M3.0, and Oroville, 1975, M5.7. Large seasonal variations in California's dams have been linked to RIS, including quakes triggered by the tallest dam in the US, Oroville. This was built on a fault previously thought inactive. The 1975 quake led to the suspension of another large dam then being constructed in a nearby watershed, Auburn Dam. \$200mn had already been spent on Auburn, making it the most expensive US project to be halted mid-stream.

**Hoover, 1939, M5.0:** The first well-documented incident of RIS. Earthquakes were rare in the area prior to construction of the dam, but seismographs registered at least 600 shallow earthquakes between 1936 and 1946.

### BRAZIL

Castanhão (numerous quakes in 2003-04), Tucuruí, 1985, M3.4; Capivara, 1976, M3.7; Carmo do Cajura, 1972, M3.7; Novo Ponte, 1995, 3.7; Porto Colombia/Volta Grande, 1964, M4.1

### HOTSPOT: Patagonia

Three tectonic plates clash near the Chilean coast, making the region one of the most tectonically active in the world. Patagonia's largest measured earthquake, a 9.5 magnitude temblor, struck in 1960 near Valdivia, destroying the city. Patagonia has been shaken by thousands of quakes in recent years. Chile has plans to build dams in the region that could set off more quakes, and create major dam-safety issues.

# At the Hidden Danger of Dam-Induced Earthquakes

## EUROPE/MIDDLE EAST

**Spain:** Canelles, 1962, M4.7; Camarillas, 100 weak quakes, 1961; Almendra, 1972, M2.0.

**France:** Monteynard, 1963, M4.9; Grandval, 1963, M4.7; Vouglans, 1971, M4.4

**Greece:** Marathon, 1938, M5.7; Kastraki, 1969, M4.6; Kremasta, 1966, M6.2

**Italy:** Vaiont, 1963, M4.5. RIS implicated in triggering massive landslide into reservoir, which caused 100m waves to overtop the dam, killing 2,500 people.

**Turkey:** Keban, 1973, M3.5

**Karun III, Iran:** The three biggest RIS quakes measured 4, 4.1, and 4.3, and occurred after two stages of rapid reservoir filling in 2005-06.

**HOTSPOT:** Hundreds of dams are proposed for rivers in Turkey and Iraq, both of which are seismically active.

## Aswan High Dam, Egypt

The Aswan reservoir reached a water depth of 50m in 1978. In 1981, a M5.2 quake and aftershocks occurred 45km south of the dam area. More quakes were felt as the reservoir's water level went above 170 m.

## Kariba Dam, Zimbabwe and Zambia

The filling of what was then the world's largest reservoir was followed by strong earthquake activity in the 1960s. Kariba's reservoir weighs approximately 180 billion metric tons, has caused numerous earthquakes, 20 of them larger than M5.0, and one 6.2. Project documents did not discuss seismicity and the design of the dam, so the quakes' affect on the dam's safety is unknown.

## HOTSPOT: Mphanda Nkuwa Dam, Mozambique

This proposed dam would be built near a major fault. A South African seismologist believes the dam could increase the risk of RIS.

**Lesotho:** Katse, 1996, M3.1. The quake caused a 1.5-km-long crack through a mountain village, damaged houses, and dried up springs.

## INDIA

**Koyna,** 1967 (M7.0). Some 35,000 tremors were recorded in the reservoir area. Because it is in a remote area of India, the death toll from its largest quake was relatively low – about 180 people. Experts say the 103m dam almost failed. Seismic activity continued for decades after impoundment.

**Killari,** 1993 (M6.1): This quake occurred in an area without significant historic seismicity – earthquake maps had classified the area as one of the least likely to experience a damaging earthquake in India. Some 10,000 people were killed.

**Bhatsa:** Intense seismic activity began six years after initial impounding. 15,388 earthquakes were recorded, the largest being 4.9.

## HOTSPOT: Himalayas

The mountainous region is one of the most seismically active areas on earth, yet hundreds of new large dams are planned. Scientists predict some of its faults may be overdue for a major quake, threatening millions of people in the region. Of particular concern is the 260m Tehri Dam, which began filling in 2005. The dam site had a M6.9 earthquake in 1991.

**China** has been rocked by at least 19 RIS incidents in recent decades, including a 6.1 quake triggered by the 100m Xinfengjiang Dam in 1962 that almost caused the dam to collapse, and hundreds of micro-quakes as the huge Three Gorges began to fill (with the chance of more, larger ones as the reservoir reaches its full level later this year). But last year's M7.9 Sichuan earthquake, which scientists say may have been unleashed by the 156-meter-high Zipingpu Dam, was the most devastating.

After the quake, Fan Xiao, a chief engineer with the Sichuan Geology and Mineral Bureau, said, "We cannot rule out the possibility that building the Zipingpu Dam induced the earthquake because the epicenter is so close to the dam." The earthquake took at least 80,000 lives. China is planning many more dams in seismically active areas.

**HOTSPOT:** China is currently building numerous large dams in its seismically active southwest region.

**Srinakarin, Thailand:** This Mekong dam was implicated in triggering a M5.9 quake. After construction began in the 1970s, an active fault was discovered, which was a main factor in the project's cost overrun of 273%. An engineer who helped design the dam has since stated he believes it is not strong enough to withstand a major earthquake, which has been predicted to hit the area.

**New Zealand:** Benmore, 1966, M5.0, Waitaki (Lake Pukaki), 1978, M4.6

# Dam Boom in Himalayas Will Create Mountains of Risk

by Ann-Kathrin Schneider

**T**he Himalaya is one of the fastest changing regions of the world due to global warming. The mountains' mighty glaciers, the source of most large Asian rivers and a critical "savings account" of South Asia's water supply, are melting. In early February 2009, Chinese scientists warned that glaciers on the Tibetan plateau are melting at a "worrisome speed," according to Xinhua news agency.

Against these dramatic developments, the governments of India, Pakistan, Nepal and Bhutan are planning to transform the Himalayan rivers into the powerhouse of South Asia. They want to build hundreds of mega-dams to generate electricity from the wild waters of the Himalayas. More than 150,000 megawatts (MW) of new hydropower is proposed to be built in the next 20 years in the four countries. At that rate, the Himalaya could become the most heavily dammed region in the world. Some of these dams – including the 3,000 MW Dibang project in India, the 1,000 MW Tala project in Bhutan, and the US\$12.6 billion Diamer-Bhasha Dam in Pakistan – are among the world's largest and most expensive planned dams.

## Wrong Choice for a Warming World

Shockingly, this dam boom is not being analyzed for the biggest threat to hydrological projects of our time: global warming. "The possible impacts of climate change are not being considered – neither for individual dams, nor cumulatively," says Shripad Dharmadhikary, author of *Mountains of Concrete: Dam Building in the Himalayas*.

A dam-building boom in the Himalayas in times of global warming is like investing billions of dollars in high-risk, non-performing assets. In the Himalayas, "melting glacier water will replenish rivers in the short run, but as the resource diminishes, drought will dominate the river reaches in the long term," says Xin Yuanhong, a senior engineer with a Chinese team that is studying the glaciers of the Tibetan plateau.

Both the initial increase in river flows as well as the subsequent decline threatens the safety and viability of the planned hydropower projects. As Dharmadhikary points out, "Most dams are designed based on historical data of river flows, with the assumption that the pattern of flows will remain the same as in the past. Climate change has effectively destroyed this assumption. It is likely that dams will be subjected to much higher flows, raising concerns of dam safety, increased flooding and submergence, or much lower flows, affecting the performance of such large investments."

The International Centre for Integrated Mountain Development, ICIMOD, in Nepal and the Intergovernmental Panel on Climate Change agree that global warming will also lead to more storms and floods, especially in tropical and mountainous regions. A report by ICIMOD on the impact of climate change on Himalayan glaciers states: "On the Indian subcontinent, temperatures are predicted to rise between 3.5° and 5.5°C by 2100. An even higher increase is predicted for the Tibetan Plateau. Climate change is not just about averages, it is also about extremes. The change in climate is likely to affect both minimum and maximum-recorded temperatures as well as triggering more extreme rainfall



Dig Tsho Glacier Lake in Nepal experienced a "glacial lake outburst flood" in 1985 when Langmoche Glacier collapsed into it, overtopping its moraine dam. Photo: © Matthieu Paley/www.paleyphoto.com

events and storms." These heavy storms and floods will jeopardize the economic profitability of hydropower projects, as well as the safety of these mountains of concrete.

The sudden bursting of glacial lakes is another major concern for the safety of planned dams, and ultimately the rivers and peoples of the Himalayas. Glacial lake outburst floods (GLOFs) are a recent phenomenon. As glaciers in high-altitude regions such as the Himalayas melt, they can form large lakes behind temporary dams of ice and rock. When these moraine dams collapse, millions of cubic meters of water are released, resulting in massive flash floods. The Dig Tsho GLOF in Nepal in 1985 was one of the most devastating glacial lake bursts in recent history. The bursting of this glacial lake near Mount Everest caused a huge flood wave that travelled down the valley, killing five people and destroying one hydropower station, many acres of cultivated land and 14 bridges.

In January 2009, the government of Bhutan identified more than 2,600 glacial lakes in the country, of which 25 are considered to be at high risk of bursting, according to Yeshi Dorji of Bhutan's Department of Geology and Mines. While Bhutan is aware of the risk of GLOFs and is improving its early warning system, the country, together with India, is still currently constructing one of the largest hydropower dams in the region, the 90-meter-high Tala project on the Wangchu River.

One billion people in South Asia and many millions in China are dependent on the Himalayan rivers. While we can't predict the future course of change to these lifelines from global warming, we can no longer presume that there will always be abundant snow and glaciers in the Himalayas. If the Himalayan governments go forward with their planned dam boom, they deny that global warming is actually transforming their region and our planet. The prudent course would be for the Himalayan countries to develop water resources in a way that helps the people of the region adapt to the changing climate, and reduces their risks. This dam building plan does the opposite. ●

Mountains of Concrete is available at [www.internationalrivers.org](http://www.internationalrivers.org)

# China Dam Plants Threaten Free-Flowing Amur

by Nicole Brewer

The Amur-Heilong River System, which forms the border of China and Russia for 3,000 kilometers, has geopolitics to thank for its free-flowing condition. But plans to dam the so-called “Three Gorges of the Dragon River” now threaten its fish, rare birds, and people.

Many great rivers of the world begin their journey within China, and most if not all of these rivers are now targeted for hydropower development. Chinese government planners seeking to expand the

country’s hydropower production have also for years tried to tap the Heilong, or “Black Dragon” River (elsewhere called the Amur), whose headwaters seep from a sacred mountain in Mongolia. But so far, the Amur-Heilong River remains undammed, and each year millions of salmon and sturgeon migrate up its banks from the sea of Okhotsk in Russia.

Had history unfolded otherwise, the Amur-Heilong River would likely have disappeared under large dams long ago, and with it the longest salmon run in Asia would have collapsed. As Eugene Simonov, a consultant to WWF’s campaign on the Amur-Heilong, explains, “The river has a very interesting character in that it is the longest border river in the world. You need common consent to create these dams, and territorial claims always were a headache.”

In the late 1950s, Russia and China hatched a joint plan to build nine dams on the river’s main stem. But due to the souring of Sino-Soviet relations in the 1960s, the dams were never built. The plans were revived in the 1980s, but by that point Russia had little need for new hydropower. Satellite images of the Amur-Heilong River watershed show a sharp distinction between the two countries: the Russian side is green, the Chinese side is brown. Over 93% of people living in the watershed live on the China side.

Today, at 4,444 kilometers, the Amur/Heilong has the distinction of being the longest free-flowing river in the eastern hemisphere. But recently, engineering plans for the main stem dams



Fishermen in the Hinggan Gorge, on the Amur-Heilong River, China. Photo by Eugene Simonov

were sold to China by their Russian designers. Not long after, local officials in Heilongjiang Province set up a hydropower investment company and coined the term “Three Gorges of the Dragon River” to attract funding for the 1,800 MW Taipinggou Dam. This project – the farthest downstream of the dams conceived as part of the old bilateral plan – would cut the watershed, and critical migration routes, in two.

He believes a free-flowing Amur-Heilong River is critical to wildlife such as the Oriental White Stork, Chinese Softshell Turtle, the Red-Crowned Crane, and fish such as salmon and the largest sturgeon species

in the world – the Kaluga. The Taipinggou Dam is certain to have impacts on these fish populations, with ripple effects to downstream commercial fishing communities, and a disproportionate impact on ethnic minority groups such as the Nanai/Hezhe. Entire towns and villages on the Chinese side would have to be relocated for the dam.

Simonov and his colleagues would like Russia and China to cooperate on an Integrated River Basin Management (IRBM) Plan, one that focuses less on hydropower development and more on habitat protection, pollution cleanup and prevention, and water use management. But he feels interim conservation measures are needed to stave off further habitat losses. Though little known to the rest of the world, the Amur-Heilong River is at the heart of the largest contiguous forest left on earth, which at 380 million acres represents an area larger than the state of Alaska. “At this point the countries are not prepared for a full-fledged IRBM plan,” he says. “It is much more obtainable to start with critical pieces, for example creating an ‘Amur Green Belt’ which can include protected lands and waters of different kinds, ensuring biodiversity conservation and environmental security along the border.”

Already, both China and Russia have national laws in place to protect much of the watershed; on the China side alone there are 220 designated protected areas. But in 2005 a massive chemical spill on the Songhua River, a tributary to the Amur-Heilong River, served as a strong reminder to both countries that greater cooperation is critical for the river’s long term health. Chinese and Russian officials alike would do well to more closely examine the many risks and costs of dam building on the free-flowing Amur-Heilong River. ●

**“This could be the nail in the coffin for efforts to restore and protect the river.”**

Eugene Simonov.

For more information, see [www.amur-heilong.org](http://www.amur-heilong.org). See also p. 14 for a review of the Amur-Heilong River Basin Reader.

# News Briefs

by Susanne Wong



Cantor's giant softshell turtle has been discovered in a pristine area of the Mekong. Photo: © David Emmett/CI

## New species hotspot along Mekong River

Scientists have discovered 24 new species, including a rare giant turtle, in a near-pristine section of the Mekong River. But the region's biodiversity faces growing threats from unregulated hunting, logging and dam construction, triggering the conservation group WWF to label the area as a "new-species hotspot."

Researchers from WWF Cambodia and the Cambodian Ministry of Agriculture, Forestry and Fisheries conducted biodiversity surveys in 2006-7. One of their most startling findings was the re-discovery of the Cantor's giant softshell turtle, previously thought to be extinct in Cambodia.

The endangered turtle can grow up to six feet in length and weigh more than 110 pounds. As defense against predators, the turtle spends 95% of its life hidden in mud with only its eyes and nose showing. To feed, the turtle extends its neck with lightning speed to bite with jaws strong enough to crush bone, says WWF.

The turtle was found in an ecologically healthy region of dense riverine forests and island archipelagos. The area is also described as one of the last suitable freshwater habitats for the critically endangered Irrawaddy dolphin.

Local people have begun reporting declines in catches of fish, turtles, large mammals and lizards. Plans to build dams and roads could push the region's rare creatures over the edge.

"Unlike many other mainstream sections of the Mekong in Cambodia, Lao PDR, Thailand and Vietnam, this particular part of the river remains relatively untouched by human activities," said Richard Zanre, WWF Freshwater Program Manager.

The latest study comes on the heels of surveys conducted from 1997-2007 that uncovered more than 1,000 new species in the Mekong River basin. "Documenting the Mekong's biodiversity and natural resources is a critical first step is to preserving them," said Seng Teak, WWF Country Director.

## Cambodians still suffer from surging dams

Villagers in northeast Cambodia were caught off-guard by a sudden water surge that authorities now say was caused by upstream dam operations in Vietnam. The sharp rise in river levels in early February alarmed villagers who have for years suffered from flooding and erratic fluctuations in river levels caused by large hydro-power dams in Vietnam.

Under the 1995 Mekong Agreement signed by Cambodia and Vietnam, Lower Mekong governments are required to follow certain protocols for notifying downstream governments about any changes in flow or dam operations that affect Mekong tributary flows. In 2007, Vietnam's National Mekong Committee formally assured its Cambodian counterparts and affected villagers that construction of a regulator dam was underway near the border, which would help reduce hazardous fluctuations and flooding downstream.

"We are relieved no lives were lost this time, but the threat is still there," says Kim Sangha, Coordinator of the Sesan, Srepok and Sekong Rivers Protection Network. "Mekong authorities have spent years and countless millions of dollars in foreign aid talking about rules and procedures for notification. What's the point if the people most at risk are still caught off-guard and never compensated for damages?"

After much delay, the Sesan 4A regulator dam is now expected to be completed this dry season but Cambodian authorities still do not know if the dam will be operated to reduce hazardous conditions downstream.

## Dam break in Tennessee

An earthen dam used to hold back waste from a Tennessee coal plant failed in December, releasing 5.4 million cubic yards of sludge (enough to flood more than 3,000 acres one foot deep), damaging homes and flooding at least 300 acres with water, mud and ash. The power plant and waste pond are operated by the Tennessee Valley Authority, the largest public utility in the US. Representatives of the agency speculated that heavy rain and freezing temperatures were to blame. Environmentalists have long argued that coal ash, which can contaminate groundwater and poison aquatic environments, should be stored in lined ponds. Coal plants around the country, most near rivers that supply the water they need to operate, store coal ash in unlined ponds.

## China delays plans to divert Yangtze River

China's \$62 billion scheme to reroute water from the Yangtze River to the arid and heavily populated north has been delayed. China's State Council confirmed rumors that construction of the central route of the South-North water diversion project will be delayed four years. However, officials reportedly told the *Wall Street Journal* that the new timetable represents an "adjustment," not a delay. "We have taken appropriate measures to mitigate the environmental adverse effects that the construction projects may make," said a spokesman.

The project has faced intense criticism from scientists and environmentalists. They argue that the project will waste tens of billions of dollars and

damage the environment while offering only a temporary fix.

Last year, local governments added their voice to the growing list of critics. Zou Qingping, the deputy chief of the Hubei Province bureau of environmental protection, told the local government that by reducing water in the Han River, a Yangtze tributary, pollution would worsen. The controversy was reported extensively by China's state-controlled media, which only a decade ago barely covered controversies associated with the Three Gorges Dam.

In response to the criticism, project officials revised plans for the central route to include building a dam and diverting water from the Yangtze into the Han River. But Du Yun, a geologist with the China Academy of Sciences, said that even those measures may not be sufficient. The new plans would divert a third of the water from the Han River's Danjiangkou reservoir. Du Yun argues that this will increase flooding and sediment loads, leading to declines in water quality. This would hamper navigation and irrigation for local residents and reduce the amount of water available for industries and cities.

## Chemotherapy for fish?

A toxic stew of medications has been detected in water samples taken from the St. Lawrence River. Researchers from the University of Montreal found bezafibrate (cholesterol-reducing medication), enalapril (for hypertension), methotrexate and cyclophosphamide (cancer drugs) in wastewater entering a Montreal treatment plant. After the wastewater was supposedly treated, researchers detected bezafibrate and enalapril in water released back into the St. Lawrence River.

The study, released in January and published in the *Journal of Environmental Monitoring*, was conducted to determine the environmental effects of huge increases in

drug consumption in recent years. In 1999, world drug consumption totaled \$342 billion. That number doubled to \$643 billion in 2006. A significant amount of the drugs consumed by humans is excreted through urine and ends up in wastewater streams. Some chemotherapy drugs are reportedly excreted practically unchanged.

"Methotrexate and cyclophosphamide are two products very often used to treat cancer and are more likely to be found in water," says Sebastien Sauve, a professor of environmental chemistry at the University of Montreal. "Even though they treat cancer, these two products are highly toxic. This is why we wanted to know the extent to which the fauna and flora of the St. Lawrence are exposed to them."

## Big wind farms take off in global south

Mexico launched a \$550 million wind farm in January on the narrow isthmus between the Gulf of Mexico and the Pacific Ocean. The country hopes to exploit its rich wind and solar potential to compensate for falling oil production. The project, which would be Latin America's largest wind farm, is expected to generate 250MW – enough energy to power a city of 500,000 people.

The climate-friendly project has not been welcomed by local residents. Several hundred protesters blocked a road leading to the site, holding a banner that said "no to the project."

"They promise progress and jobs, and talk about millions in investment in clean energy from the winds that blow through our region," a leftist farm group known as the Assembly in Defense of the Land said in a statement. "But the investments will only benefit businessmen, all the technology will be imported ... and the power won't be for local."

And in January, a private developer announced it is moving forward with a 300MW

wind farm near Lake Turkana in northern Kenya, which is expected to become operational by 2011. The project would increase the nation's installed capacity by 30%.

## Dams underway in Kashmir

India has started construction on three dams on the Indus River in the contested region of Kashmir. *The News* (Pakistan) reported that the construction started in violation of the Indus Water treaty and threatens the fragile environment in the Ladakh region.

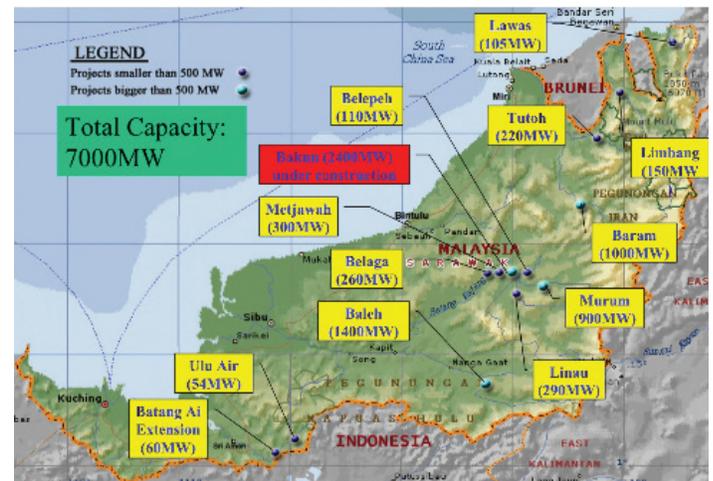
## Chile's environmental review process damned

Plans to dam Chile's Baker and Pascua rivers in Patagonia already threaten one of Earth's most treasured wild places. Now the plans also threaten the integrity of Chile's environmental review process.

HidroAysén, the Chilean-European company planning the dams, submitted an environmental impact assessment (EIA) in August 2008. Thirty-two Chilean public services re-

viewed the EIA and concluded that it was so inadequate they were unable to complete their review properly. Legally, this required rejection of the EIA. Instead, buckling under political pressure, a Chilean environmental agency gave HidroAysén nine months to provide additional information – and then approved the EIA in advance of receiving this information.

Chilean lawyers have filed legal actions to challenge this decision. Meanwhile, International Rivers and its Chilean partners plan to widely publicize the EIA's most glaring deficiencies. These include: no maps that would show exact locations for dam structures; insufficient information about geological instability in the likely dam locations; erroneous figures for amount of area to be flooded; no information on relocation of people displaced by the dams; no discussion of impacts from worker camps required to build the dams; no estimate of public works impacts from a new port, new roads and new airport demands required by the dam plans; and no analysis regarding impacts on tourism based on the region's globally famous sport-fishing and trekking.



### Hydropower Projects in Sarawak 2008–2009

The Sarawak state government's secret plans to build 12 hydro dams in Borneo's rainforest were uncovered by the Bruno Manser Fund. The dams would submerge the lands of about a thousand Penan, Kelabit and Kenyah tribal people. The looming threat triggered Survival International to label this one of its top five tribal stories of 2008. [www.survival-international.org](http://www.survival-international.org)

# In Print

## Energy [R]evolution: A Sustainable Global Energy Outlook

by the Institute of Technical Thermodynamics of the German Aerospace Center. Published by Greenpeace International and the European Renewable Energy Council. 2008, 212 pages. Download from [www.greenpeace.org/energyrevolution](http://www.greenpeace.org/energyrevolution)



This new study shows that a transition to a renewable energy infrastructure is not only possible, but also is cost-efficient, creates jobs, and protects the planet.

The report outlines a scenario in which humanity could get half its energy from renewable sources by 2030, and 80% by 2050. New and improved technologies, massive reallocation of energy infrastructure investments, and across-the-board improvements in energy efficiency are all requirements for the scenario to work. The report states that a “business as usual” scenario would lead to global energy consumption increasing by a third by 2020, and lays out an aggressive efficiency strategy to reduce energy consumption in industrialized countries by 10%, while allowing developing countries to increase their energy use by 20%. “Right now, computer servers worldwide devour more electricity than the entire demand from France – and energy use is expected to double again in the next five years,” the authors state. “Compared to best

practice server technologies, about half of this energy goes to waste – enough to power Australia. A strict efficiency standard for servers could take 48 coal-fired power plants off the grid – saving over 140 million tonnes of CO<sub>2</sub>.”

An annual investment of US\$590 billion until 2030 would fund this revolution – an amount equivalent to less than two years’ worth of global fossil fuel subsidies. In fact, the \$15.9 trillion that is expected to be spent on additional coal power until 2030 would be enough to pay the \$14.7 trillion price tag of the scenario’s power generation investment requirements. This new energy infrastructure would lower fuel costs by 25% and save about \$750 billion annually, the authors state. Renewable technologies would also create more jobs than would the same amount of investment in non-renewable fuels because they are more labor intensive.

The report makes clear that the main impediment to a renewable energy future is not technological, but political. Right now, we still have a chance to create a win-win-win situation for energy security, the economy and the climate. The choices of governments and international financial institutions in the coming years will either set the stage for an energy future that helps us adapt

to climate change, or one in which we dig ourselves further into a very large hole. If they choose to keep digging, that hole could very well become our grave. But there is still time to create a better world. That time is now.

Berklee Lowrey-Evans

## The Amur-Heilong River Basin Reader

edited by Eugene A. Simonov and Thomas D. Dahmer; published by WWF, Ecosystems Ltd., 2008. 426pp. US\$75. Available at Amazon.com or free download at <http://www.wwf.ru/resources/publ/book/eng/299/>

This new report by WWF’s Amur/Heilong Initiative is the first compilation of material on the natural resources and conservation challenges along Asia’s longest free-flowing river. The encyclopedic *Reader* maps and references a wide range of research on the basin, providing an overview of everything that makes it unique, from the divergent patterns of development on the Russian and Chinese sides of the river, to the presence of rare species such as the Siberian Tiger and Kaluga Sturgeon. Encompassing northern boreal, temperate and subtropical biomes, the Amur-Heilong basin supports a tremendous diversity of habitats. The basin’s floodplains serve as an important link in the chain of stopover

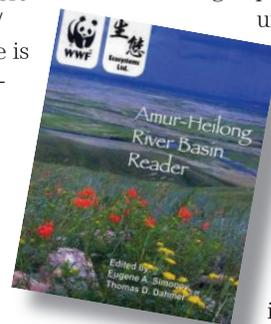
and nesting sites for millions of migratory birds of three major transcontinental flyways.

The *Reader* also tells us why the river needs our help. The Amur-Heilong River system forms a 3,000-km border between Russia and China, and past and present economic cooperation between the two countries have helped to speed up development in the area. The downside of these efforts has been many serious impacts on the basin: agriculture and infrastructure are destroying wetlands, legal and illegal logging eliminates forests, overgrazing threatens grasslands, over-fishing depletes fish stocks, and

untreated waste is polluting water and soil. There are already 80 hydropower stations on tributaries to the river, some with enormous reservoirs, and now Chinese officials are pushing for a new dam – possibly the first in a cascade – on the main stem of the river (see story, p. 11).

The final section of the *Reader*, “Options for the Future,” is a collection of essays that suggest practical, feasible steps that can be taken now by China, Russia, and Mongolia to protect the river basin and all the life that depends on it. These steps are held together by the concept of “Integrated River Basin Management,” which asks decision-makers to put politics aside and manage watersheds as a whole.

Nicole Brewer



## South Africa *continued*

said in December they had already retrofitted 4,000 buildings, at an annual savings of \$5.6 million in electricity costs. More daunting institutional reforms round out the list, including: building institutional leadership, changing incentive structures, building consumer education programs, and improving data collection and transparency.

SEA is cautiously optimistic that the times are indeed changing. “Although overall achievements have to date been small com-

pared to what’s needed, there is no doubt that government has started to take the need for efficiency seriously, and its reasonable to expect the next few years to deliver much greater gains than we’ve seen to date,” says Borchers. “In an energy sector characterized by lack of capacity in some key local and national government departments, strong vested interests and fragmented governance, government will need to be strong to achieve this. May we be up to the challenge!” ●

**WRR: What are the most exciting advances coming up in the world of energy efficiency?**

**JW:** There is a lot of attention to the growing problem of energy use from personal electronics, and I'm very impressed with how quickly the electricity use from flat screen TVs is coming down. I'm also very excited about the serious enthusiasm we're beginning to see for "zero net energy" buildings, which would be highly efficient and have integrated renewables such as solar PV. We were successful in making incremental improvements in building code over the past 30 years, but with the climate crisis people are now thinking much more expansively. That is, rather than thinking about how to use the most efficient heating and cooling equipment in a building, people start by thinking how to design a building with no heating or cooling system. This is a complete change in our approach to buildings. And it goes beyond a building's energy use – there is growing interest in "green buildings" which are efficient users of water as well as energy, and use other sustainable materials as well.

**WRR: Many parts of Africa have extremely low domestic energy use, but support energy-intensive industries that sap huge amounts of power (often sold at discounted rates). In this scenario, it must seem to local energy planners that saving energy one air conditioner or one light bulb at a time is a low priority compared to securing new supply. Is there hope for such lopsided situations?**

**JW:** That's a huge problem, and a very tough one. There's a sense in many developing countries that you have to have increasing energy consumption to feed economic growth. In the US our econ-

omy grew three times, but our energy use only grew by about a third. The extractive industries in the global south are not focused on efficiency, and at least until recently, high commodity prices reduced even further their incentive to save energy. But other businesses and residents in those countries are competing for this limited resource, and paying higher prices for energy. I think there is a strong role for public policy here – especially efficiency standards and utility efficiency programs. Efficiency programs can cushion consumers from the higher prices for energy, and well as reduce the total costs of the energy system, since new capacity inevitably costs more.

**WRR: What are the biggest obstacles to improving efficiency worldwide? Are there promising developments that give you hope?**

**JW:** I'm encouraged by the growing interest from the philanthropic community in climate and environmental issues. Last year I moved from government to the nonprofit world where I am working to build advocacy networks for good policies, and to facilitate a global information exchange of the best practices – what works and what doesn't work. Developing environmental NGOs in countries without a strong culture of civil society offers great hope for improving public welfare and protecting natural resources. It's a very exciting time – fraught with opportunity.

**MORE INFORMATION**

*The Energy Foundation:* [www.ef.org](http://www.ef.org). *Our new fact sheet on efficiency:* [www.internationalrivers.org](http://www.internationalrivers.org).

**Dam Standards** *continued***...to be replaced by no standard?**

The HSAF members claim that their process "is not an attempt to duplicate or rewrite the WCD outcomes." Yet an interim document which the HSAF released for consultation in January espouses a perspective which is very different from the WCD's rights-based approach. If widely adopted, the new approach would represent a huge setback in international development policy.

The HSAF document doesn't identify any minimum standards or requirements that dams must fulfill in order to be considered sustainable. It instead expresses a view that all impacts can be handled and mitigated through a host of consultants' reports and management plans. The following examples illustrate this approach:

- The draft document does not require that dam developers comply with national law, international human rights norms, and international conventions on issues such as transboundary rivers.
- The document does not recognize indigenous peoples' right to free, prior, informed consent about projects (such as dams) that affect their lives. It simply proposes assessing whether dam developers "understand the legal rights as embedded in national and international law."
- The document does not recognize the right of affected people to have access to information about projects, but instead proposes measuring the "quality of the project communication strategy."
- The document does not require any land-based compensation for dam-affected people. Instead it proposes to measure the "degree of change in living standard of directly affected stakeholders" and the "level of compliance with resettlement legislation and standards requirement" (without identifying any standards).
- The HSAF document does not prescribe international competitive bidding for dam contracts, which is a standard requirement

to discourage corruption in large projects. It merely proposes measuring criteria such as the "quality of the bidding documents, including addressing anti-bribery issues."

- Instead of defining labor rights (such as the right to unionize) in dam construction, the document proposes scoring attributes such as the "quality of the labor management system."
- The document does not respect any no-go areas for dam building such as national parks or World Heritage Sites. It instead proposes measuring the "quality of plans to manage for biodiversity and conservation objectives" and the "degree to which biodiversity and habitat management plan is likely to achieve objectives."

**Excluded from the negotiating table**

The process through which the new Sustainability Assessment Protocol is being prepared illustrates how the dam industry works to disenfranchise affected people. While all interested groups were invited to participate in the WCD process from the beginning, the HSAF is a self-selected group. Dam-affected people and advocacy groups are not represented at the negotiating table. The Forum started a belated consultation process in January, half-way through the HSAF process. Even then, it did not translate key documents or support affected people to effectively participate in the process.

"The dam industry is looking for NGOs' endorsement for what they have already framed as a policy document," comments Ali Askouri, an activist from the area affected by the Merowe Dam in Sudan.

In conclusion, the HSAF's approach ignores the hard lessons of decades of development disasters. Mitigation plans, consultant reports and scorecards cannot replace minimum standards and enforceable rights. Trying to do so will not find the broad endorsement that the dam industry is currently seeking. ●

# Three Gorges' Sister Dams Near Completion

by Katy Yan

In the grand canyons of the Jinsha (“Golden Sands”) River in central China, a dozen dams are being planned to fuel China’s rapidly growing cities and industries. Since Beijing’s recently announced economic stimulus package, the construction of these dams have sped up, making environmental impact assessments somewhat of an accessory, according to Professor Jiang Gaoming of the Chinese Academy of Sciences.

The first two dams, the 260-meter-high Xiluodu and 160-meter-high Xiangjiaba – China’s second and third largest dams – are now being built on the Jinsha, a tributary of the mighty Yangtze River. A primary motivation for these projects is to reduce the enormous amount of “Golden Sands” silt entering the massive Three Gorges Dam downstream. If unchecked, the sedimentation at Three Gorges could seriously harm the dam’s turbines and reduce the reservoir’s overall lifespan.

Altogether, these two dams will produce 19 gigawatts of power, which is four times greater than the capacity of the Hoover Dam. The company building the dams, the China Yangtze River Three Gorges Project Development Corporation, expects that both projects will be completed by 2015.

While cost estimates for Xiangjiaba hover at around US\$4.2 billion, higher figures have been suggested. This would not be surprising, given the budget-breaking experience of Three Gorges, which has seen its costs skyrocket due to the embezzlement of resettlement funds, construction of extra retaining

walls to prevent landslides, and the clean-up of the reservoir’s polluted waters.

The huge dams are being built in a recognized earthquake zone, and could add to the risk of reservoir-induced earthquakes in the region (see pp. 8-9). In addition, more than 125,000 people have already been resettled out of the Xiangjiaba and Xiluodu reservoir areas. They represent several different ethnic minority groups from six counties within Yunnan and Sichuan provinces.

Besides being home to these ethnic groups for thousands of years, the Jinsha River region represents one of China’s most important biodiversity hotspots. It also serves as a prime river-rafting destination for adventure-seekers from around the world. However, all of this will soon change.

In addition to the 12 dams planned for the Jinsha, its major tributaries are also being dammed: six dams are planned on the Min River, 17 on the Dadu River, and 21 on the Yalong River. One of these 12 Jinsha dams, the controversial Tiger Leaping Gorge Dam, has been scrapped for the Longpan Dam farther upstream, according to Professor Jiang. If Longpan Dam is built, experts expect severe impacts on the region’s biodiversity and the resettlement of 100,000 mainly ethnic minority individuals.

As in the case of Xiangjiaba and Xiluodu, and the rest of the Jinsha dams, “The problem with large scale dams” argues journalist Ma Jun, “is that they make it almost inevitable that more dams will be built, just to keep the existing ones functioning.” ●



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## It's time for the annual Day of Action for Rivers!



Last year, these children sang in honor of the Salween River at an event organized by Karen Rivers Watch, and participated in a drawing contest with the theme, “My River, My Life.” More than 100 inspiring actions took place in 35 countries last year on March 14.

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