

# World Rivers Review

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## Arguments Heat Up Over Water, Dams and Climate Change

by Patrick McCully

**D**ams are moving into the forefront of the climate change debate for two reasons: because existing dams are likely to be badly affected by climate change, and because dam developers are trying to get subsidies from mechanisms devised to mitigate the impacts of climate pollution.

Hydrological changes are expected to be some of the most serious consequences of global warming, causing increased flooding and droughts. One result will be a reduction in the ability of dams to provide services such as hydropower and water supply. Serious floods and droughts affecting many parts of the world in recent years, and rapidly melting glaciers in the world's mountainous regions, give a taste of things to come.

The dam industry has been working hard to ensure that large hydro projects gain from the emergent trade in "carbon credits" that is being established under the Kyoto Protocol (while neglecting to mention the hydrological impacts of climate change in any feasibility studies for dams, or that dam reser-

voirs themselves can emit significant amounts of greenhouse gases).

IRN and the Bali-based NGO CDM Watch released a report at the latest round of UN climate negotiations, held in Delhi in October, which reveals that the large-hydro industry could be one of the biggest winners from the carbon trading mechanisms of the UN's Kyoto Protocol. The report shows that efforts to reduce climate pollution will suffer as a result. The new report, "Damming the CDM," shows that big hydro threatens to undermine the Kyoto Protocol by providing carbon-reduction credits for projects that do not actually reduce emissions. Thus far, large dams make up the lion's share of the efforts to reduce climate pollution through carbon trading.

### Poor Most Vulnerable

The Delhi meeting showed a growing realization at governmental levels that intensified floods and drought are now inevitable and that the poor in developing countries are most vulnerable to them, while being the least responsible for greenhouse pollution.



Severe droughts are currently causing

economic hardship – and in some cases starvation – across Sub-Saharan Africa, India, Southeast Asia, North America and Australia. In Africa, drought is exacerbating the shocks to the continent's food production systems caused by collapsing economies, political and ethnic violence, and the AIDS epidemic. James Morris, executive director of the UN World Food Program (WFP), told the UN Security Council in December that Africa is facing an "immense hunger crisis" with some 40 million people at risk of starvation. While the drought in southern Africa has received most attention in recent months, concern is now growing over drought in Ethiopia, Eritrea and the Sudan.

Much of central and northern India is suffering its fourth consecutive year of drought. Some areas of India received as little as a tenth of average rainfall during the crucial June-September monsoon. In November the WFP told the media that "startling weather patterns have sabotaged the Cambodian rice crop" for the past three years with cycles of exceptional floods and droughts, and that 670,000 Cambodians need food aid.

While none are starving, farmers in Australia and the US are also suffering serious drought-induced losses. The Australian government recently said that much of New South Wales is facing its worst drought in a century. Almost the entire western half of the US, as well as large parts of the midwest, southeast and far northeast, have been officially classified as drought-affected in the past year.

### Deadly Floods

The summer of 2002 will be remembered in central Europe for what is being termed "the flood of the millennium." Direct damage in

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## THE YEAR IN REVIEW

Dam activists were busy in 2002, defending rivers and the communities that depend on them. They managed to suspend or stop high-profile dam projects in Uganda, Turkey and other countries. For the first time ever, an international dam-building company, Acres International, was sentenced for corruption in a court case. And the visionary recommendations of the World Commission on Dams continue to gain recognition.

That said, large dam projects – which seductively combine the interests of big business, individual gain and political prestige – continue to crop up worldwide. Massive dam-building programs are still in full swing in countries like China, India and Brazil. African leaders are seriously considering developing the Grand Inga project on the Congo, which would be larger than all hydropower plants in India combined. Dam-builders have even tried to market hydropower as a means of "clean development" so that they can reap new subsidies under the Kyoto Protocol.

This issue takes a broad look at the state of the world's rivers, and the movement to protect them. We look at the big trends in the world of rivers, and the "cumulative impacts" of policies and politics that pose threats to rivers around the globe.

## Climate Change: New Excuse for Dams?



The latest round of international climate talks, held in New Delhi in late October, had almost as much emphasis on how to adapt to climate change as on how to prevent it. Anything that deflects international attention from the urgent need to cut climate pollution should be regarded with caution. Even more so when, as with the issue of adaptation, it suits the interests of the fossil fuel-addicted Bush Administration. "We're welcoming a focus on more of a balance on adaptation versus mitigation," a senior US negotiator in New Delhi told the *New York Times*.

Yet, under even the most wildly optimistic scenario for cutting climate pollution, societies are going to have to adapt to its impacts. The worsening droughts and floods scientists have warned about are already being experienced, and there can be little doubt that much worse is on the way. Most at risk are people who are directly dependent on ecosystems for their survival – peasants, indigenous people and fisherfolk, as well as those forced by poverty to live in zones at high risk from landslides and floods. These are the people who are least responsible for climate pollution (and thus can do least to prevent it) and who also can least afford the costs of adaptation.

The arguments at Delhi over adaptation centered on who should provide how much money to poor countries to pay for it. Three separate funds are being set up to assist developing countries with climate-change-related activities, primarily adaptation. All the funds would be administered by the Global Environment Facility, based in the headquarters of the World Bank in Washington, DC.

It still unclear how much will be paid into these funds. However, the EU and other developed countries (with the notable exceptions of the US and Japan) have promised \$410 million a year in "new" climate change funding starting in 2005. Whether this funding will actually appear – and whether it will quietly be accompanied by cuts in other aid programs – remains to be seen.

But even if there is little new money from aid budgets for adaptation, there are likely to be lots of new adaptation projects. Some money will be diverted from existing aid budgets, and some projects that would have gone forward anyway will be relabeled as "adaptation" projects.

While there was lots of discussion about funding for adaptation, there was very little discussion in Delhi of what adaptation might actually mean in practice. Money and attention for adaptation to worsening floods and droughts could theoretically help reduce the vulnerability of the poor to climate change. But given past approaches to water management it could also prove highly damaging to economies and rivers.

It is not overly cynical to foresee that bureaucrats in aid agencies and water ministries will push for the same kinds of projects to adapt to global warming as they have always pushed as responses to floods and droughts.

Business-as-usual in water management would mean "adaptation" funds going to big dams, inter-basin water transfers, and flood-control embankments. Yet these strategies have proved counterproductive in the past and are largely responsible for the epidemic of water mismanagement that now affects almost every part of the globe. More dams and embankments will also compound the stress that climate change will put upon freshwater ecosystems.

A serious attempt to assist those countries and sectors of society most at risk from climate change would instead focus on effective flood management strategies (including better watershed management and urban planning, wetland restoration, flood shelters and early warning systems); rainwater harvesting and, most important of all, reducing water demand through conservation and efficiency. Adaptation to climate change is also for many countries going to require diversification of electricity supply away from drought-vulnerable hydropower.

These strategies would not only be much cheaper than the conventional river-destroying approach to flood and water management, but they would also work much better and thus save many lives. Perhaps most important of all, such strategies would also bring great benefits even in the absence of any drastic climate change.

"Adaptation" threatens to become the next "sustainable development" – an empty catch phrase that among other abuses is used by aid bureaucrats to give legitimacy to destructive projects. Or it could become a focus for efforts to reduce the vulnerability of societies to climate change, while improving people's lives and regenerating rivers.

Patrick McCully

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**Contact Information:**

IRN  
1847 Berkeley Way  
Berkeley, CA 94703 USA  
Tel: (510) 848-1155  
Fax: (510) 848-1008  
E-mail: [irn@irn.org](mailto:irn@irn.org)  
World Wide Web:  
<http://www.irn.org>



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of the Earth International.

# Human Rights Dammed Off at Three Gorges

by Doris Shen & Peter Bosshard

*The following summarizes the findings of a new investigative report on the state of resettlement for Three Gorges Dam, by Yi Ming, a China-based researcher. The full report will be posted on IRN's web site ([www.irn.org](http://www.irn.org)) in mid-January.*

**W**ith a planned capacity of 18,200 megawatts, the Three Gorges Dam on China's Yangtze River is the world's largest power project. The dam has been the dream of Chinese leaders for more than 80 years, including Sun Yat-Sen, Mao Zedong and Deng Xiaoping. Li Peng, the outgoing chair of China's parliament, has repeatedly called the project a "symbol of the superiority of the socialist system."

The Three Gorges project is being built without funding from the World Bank, but with major support from official export credit agencies and private banks. The dam on the Yangtze is thus a model and a test case not only for China's political system, but also for the policies of the involved export credit agencies and banks.

The biggest challenge for the dam-builders is the resettlement of the people living in the reservoir area. More than 1.2 million people – and according to some estimates, up to 1.9 million people – will have to be resettled before the Yangtze valley is submerged. "Our goal is to ensure that those resettled will have better working and living conditions," announced Li Boning, head of the Three Gorges Migration Office. "The compensation we are offering is much higher than their expected losses," said Li in 1993.

Three Gorges Dam blocked off the Yangtze River flow at the town of Sandou-



Photo: Yi Ming

*A woman from Gaoyang township sits on rubble from a building demolished for Three Gorges Dam. Gaoyang residents who were resettled to state farms hundreds of miles away were dissatisfied and are returning to this city of ruins.*

ing in November 2002. The reservoir will start rising in April 2003, reaching a depth of 135 meters by June 2003 (and stretching 500 kilometers upstream) and 175 meters by 2008. So far, more than 640,000 people have been resettled. Tens of thousands will still need to move before submergence starts in April 2003.

With submergence imminent, the Three Gorges project has reached a critical stage. It is time to take stock of how the resettlement program has been carried out so far, and how the project authorities and the involved financial institutions have fulfilled their responsibilities. International Rivers Network has commissioned a long-time observer of the Three Gorges Dam to visit the project area and the resettlement sites, and to prepare a report on the current status of resettlement, compensation and rehabilitation. Because of the lack of freedom of speech and expression in China, the researcher is using a pen name, Yi Ming.

## Current Status of Resettlement

The researcher has prepared an eyewitness account based on a large number of interviews with affected people in five of the counties that are most affected by resettlement for the Three Gorges project. Some of the main findings are:

- Compensation offered resettlers has fallen short of the replacement cost for their

property. Instead, they are forced to buy housing at a cost that far exceeds the compensation they have been offered.

- The land and jobs that have been promised to resettlers from rural and urban areas are no longer available. Where land has been offered, it has often turned out to be of inferior quality. While approximately 500,000 people have been resettled to other areas in the Three Gorges region, more than 100,000 people have been forced to leave the Three Gorges area altogether.
- Local authorities appear to have diverted a large part of the resettlement budget into unrelated infrastructure projects, using funds intended for household compensation on projects like hotels and roads.
- According to the report, there is a "widespread belief that local officials have used the project as an opportunity to fill their own pockets." Many cases of embezzlement of resettlement funds have been documented.
- No independent grievance mechanism exists, and the resettlement process is conducted "in an atmosphere of officially orchestrated secrecy and intimidation."
- The police have used "excessive force" to quell the numerous protests against the resettlement problems, and the Three

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## What is IRN Doing?

International Rivers Network and other NGOs continue to monitor the implementation of the Three Gorges Dam, and the resettlement and human rights situation in the project area. We will hold the governments and financial institutions involved in Three Gorges accountable for the resettlement problems and human rights violations of the project.

# Fighting for Their Lives

## Mekong River Communities Take on Basin-Wide River-Development Schemes

by Aviva Imhof

“Mekong is our mother. It provides all things for us and will do so forever, so we must fight for the life of the river.”

These are the words of Mr. Niwat Roikaew, an activist from the small Thai village of Chiang Kong, located on the Mekong River opposite Laos. Like millions of people in mainland Southeast Asia, Mr. Niwat fishes in the Mekong, travels along it in his boat, and grows vegetables on its banks.

But Mr. Niwat's life is about to change, and he knows it. In 2000, China entered into an agreement with Burma, Laos and Thailand to blast rapids and reefs in a section of the upper Mekong River to make it navigable for ships up to 100 tons. The blasting, which began last year, has already affected the river, making it difficult for villagers to collect edible seaweed and catch fish.

After discovering this project and learning of its impacts, Mr. Niwat enlisted his local conservation group to fight the plans. He's been educating other villagers about the project, has led demonstrations, and is demanding a halt to the project until a full and comprehensive EIA has been done. While the second stage of the project began this month, Mr. Niwat's efforts have not been in vain. Thailand has put a halt to blasting on its side of the Mekong at least for the next year, and Mr. Niwat will continue fighting for a permanent halt.

What is remarkable about Mr. Niwat's activities is that his group is not fighting alone. He is supported by activists in Thailand, Cambodia, Yunnan Province of China, the US, Australia, Japan, Canada and other countries around the world. More than ever before, communities along the Mekong are joining together to protect their rivers, their homes and their ecosystems. And more than ever before, this kind of cooperation is needed.

China's plans to build up to eight dams on the Upper Mekong presents a massive threat to the entire river basin. China's Upper Mekong dams could wreak havoc on the lower Mekong basin – drastically changing the natural flood-drought cycle of the river, decimating fisheries and reducing soil fertility. Yet the governments of the lower basin remain silent, beholden to China's vast economic and political power, and afraid to draw attention to their own dam-building plans.

Says Dave Hubbel, an activist with the Thai-based environmental group TERRA, “If governments of the lower basin start criticizing dams in China, that puts them in a bind, because they want to build their own dams. They are quietly hoping that someone will stop China, but that nobody will stop them from building their own dams.”

But what governments aren't prepared to do, communities are – and that is work together. Last April, representatives of fishing communities in the countries of Cambodia, Lao PDR, Thailand and Vietnam met in Phnom Penh, Cambodia, to convene the Regional Conference of Fishers of the Mekong River Basin. The conference adopted a declaration recognizing the need for all fishing communities to “actively engage with each other to form networks based on friendship, respect and exchange of knowledge and experiences ... The objectives of these community networks is to promote the sustainable use and conservation of the fisheries and natural resources of all the people of the Mekong Basin.”

The fisherfolk declared that “it is the people of all local communities who have the right to decide how our rivers, forests and lands are used, managed and conserved.”

In Thailand, communities are becoming increasingly successful at demanding involvement at decisions affecting their lives. Through protest actions, letter-writing campaigns and negotiation, communities have had considerable successes. Several irrigation and water diversion projects are on hold in Thailand due to opposition. Last July, the Japan Bank for International Cooperation (JBIC) agreed to cancel a study into a project that would divert water from a Mekong tributary in Laos to northeastern Thailand.

According to JBIC, “After the meeting with ... NGO representatives in Thailand, ... we reached the conclusion that we could not assure that adverse impact to the local residents may not be caused if it's carried out.”

In Cambodia, thousands of villagers who have suffered severe impacts to their livelihoods because of the Yali Falls Dam (upstream in Vietnam) continue to organize, mobilize and demand compensation for their losses. The Yali Falls Dam has altered the hydrology and water quality of the Sesan

River, causing deaths to villagers and livestock and flooding rice fields and vegetable gardens. More than 55,000 people are estimated to be affected, and have received no compensation for their losses.

The Yali Falls Dam is the first of several hydropower dams planned for the Se San River in Vietnam. Swedish and Norwegian aid agencies have supported the Vietnamese government in these efforts, by producing feasibility studies and rankings for its many proposed dams. Work on the second dam, Se San 3, just 20 kilometers downstream from Yali Falls Dam, began last June. Villagers living in Stung Treng Province, Cambodia, were upset when they heard about the project. “What more can they do to us?” asked one local woman. “Nearly everything has already been destroyed. If they build another dam, there will be even more destruction. More people will die. I will gather all the people from my community and tell them we must stop the dam.”

In response, 18 villages formed the Se San River Community Protection Network this year to work together to secure compensation for affected communities and stop further dam construction on the Se San River. They will be a force to be reckoned with.

### Trade the Rivers Away

In other parts of the region, the World Bank, Asian Development Bank and governments are taking advantage of the limited freedoms for civil society to promote a regional power grid based on massive dams.

In November, leaders of the six countries of the Mekong region signed an Inter-Governmental Agreement on Regional Power Trade facilitated by the Asian Development Bank and the World Bank. While the title sounds fairly innocuous, this scheme will affect millions of people who depend on the Mekong River and its tributaries for their way of life. The aim of the agreement is to form a regional power grid, based on hydropower as the fuel for development.

The project, which is part of the ADB's Greater Mekong Subregion Program, will involve construction of vast transmission lines to create a subregional grid. It will also encourage private sector investment in power and develop a system of power trad-

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About 50 villagers from Northern Thailand who are affected by the Mekong Navigation Project demonstrate in front of the Chinese Embassy in Bangkok to demand a halt to the blasting of rapids.

ing in the region. It was developed without any input from local communities, members of civil society, local or international non-governmental organizations.

The ADB Vision is that Yunnan, Laos and Burma – where community opposition is stifled – will become power suppliers to growing markets in Thailand and Vietnam. The majority of power would be produced through hydropower. Proposed transmission lines would link Thailand to the Ta Sang Dam on the Salween River in Burma, the Jinghong and Nuozhadu dams on the Mekong mainstream in Yunnan, and would link Thailand and Vietnam to the controversial Nam Theun 2 Dam in Laos.

“The scheme is preposterous for a number of reasons,” says Susanne Wong from IRN. “The ADB’s support for this scheme indicates that it has learned nothing from its appalling history of support for large dams in this region. Its two flagship hydropower projects in Laos – the Theun-Hinboun Hydropower Project and Nam Leuk – have resulted in the destruction of thousands of people’s livelihoods, many of whom remain uncompensated for their losses. Planned dams in Burma, China and Laos will replicate this destruction on a grand scale.”

What’s more, the project is economically flawed. Says Chainarong Srettachau of Southeast Asia Rivers Network, Thailand: “Thailand doesn’t need the power from these dam projects. We will be forced to import costly hydropower at the expense of

developing environmentally and socially acceptable alternatives.”

According to Grainne Ryder from Canada’s Probe International, Vietnam also doesn’t need the power from its neighbors. Vietnam has vast reserves of natural gas, and its potential for renewable energy technologies is unexplored. Hydropower will be costly and uneconomic, saddling consumers in both Thailand and Vietnam with additional debts.

At a recent meeting in Phnom Penh, affected people and NGOs from all six countries comprising the Greater Mekong Subregion demanded a halt to further investments in the plan until a comprehensive assessment of energy alternatives for the region has been made, in compliance with World Commission on Dams guidelines.

### Regional Network Gathers Steam

Local communities and river activists are not just working together in the Mekong region, but all over East and Southeast Asia. Last February, Rivers Watch East and Southeast Asia (RWESA) held its second meeting. RWESA is a network of NGOs and peoples’ organizations from East and Southeast Asia – supported by their allies internationally – that was formed in July 2000. The network aims to stop destructive river development projects in East and Southeast Asia and to restore rivers and communities’ livelihoods.

One of the most amazing things about the RWESA meeting, which was attended

by 80 dam-affected people and NGOs from 10 countries in the region, was the number of languages being spoken at one time. The meeting was conducted in about six languages, with translators working the hardest of all.

RWESA has gone from strength to strength in the past two years. The network has organized workshops on the World Commission on Dams in six countries in the region, is translating the “Citizens Guide to the WCD” into seven languages and is gearing up for a major campaign targeting the Japan Bank for International Cooperation for its role as the main funder of the region’s dam projects. RWESA is becoming a force to be reckoned with in the region, a strong reminder that working collectively is the best recipe for success.

Says Joan Carling, RWESA Facilitator and Chairperson of the Cordillera Peoples’ Alliance in the Philippines, “RWESA is making sure that dam-builders are no longer able to go about their business as usual. Developing the strength of affected communities is our most powerful tool in preventing destructive developments, and this is really what RWESA is all about – building the capacity of communities to resist and make a difference. There’s optimism now – more and more communities are knowledgeable about these destructive projects and are fighting them.” ■

## Call to Action!

March 14, 2003 is the 6th annual Day of Action Against Dams and For Rivers, Water and Life. Last year, more than 60 events took place in 28 countries, with hundreds of thousands of people taking action to protect living rivers around the world.

International Rivers Network will serve as the international coordinator for the Day of Action once again this year, and we hope you’ll find a way to demonstrate your commitment to rivers in 2003. By acting together we can promote more equitable and sustainable ways of managing our waterways.

**For more information, visit [www.irn.org/dayofaction](http://www.irn.org/dayofaction), or write [dayofaction@irn.org](mailto:dayofaction@irn.org).**

# The Good, the Bad and the Ugly

## A Wild Ride for North American Rivers in 2002

by Elizabeth Brink

**T**he recent story of rivers in North America has been a study in contradictions. Given the Bush administration's positions on the environment and the resurgence of grandiose, outdated river-modification schemes, one could easily expect the current story of rivers in North America to be a tragic tale without redemption. Indeed, the rabidly anti-environment, pro-business administration has been working diligently to set back river protections on all fronts. But all is not gloom and doom; on the contrary, there is a surprising amount of good news to report. Below is a roundup of some of the key issues affecting North America's rivers in the past year: the good, the bad and the ugly.



One of the best pieces of news for US rivers is that the current administration has failed to stop the tide of dam removals sweeping the nation. Upon taking office, it appeared that the Bush administration would attempt to slow the trend of dam removal and restoration of river habitats in its tracks. In a September 2000 interview, Bush said that barring local requests, he was against removing dams. However, here's the good news: a record 63 dams were slated for removal in the US in 2002, compared to the approximately 22 dams taken out in 2001. Clearly, the restoration trend continues in spite of prominent opposition.



But as local initiatives to remove dams continue apace, ambitious federal decommissioning projects such as those on the lower Snake River in Washington have stalled. In 1998 then-Secretary of the Interior Bruce Babbitt identified the brewing battle over the Snake and "its four fish-killing dams" as "the next big step for river restoration." Unfortunately, it remains so. The fish are still dying and the decision-makers are still dragging their feet.

While on the campaign trail, then-candidate Bush said of the Snake River dams: "People have been able to make a living off rivers and at the same time coexist with nature. If George W. Bush becomes president, the dams will not be breached. These dams are important to a way of life. Agriculture is an important part of national security and so is energy." The dams provide only 5% of the region's electricity, but all five species of the river's salmon are now endangered.

A year ago, the US Army Corps of Engineers chose to attempt "system improvements" on the Snake River rather than decommission the four dams scientists widely view as the key barriers to salmon recovery. It is not working. The Corps' methods, including barging and trucking the fish around the dams, will be officially re-evaluated in 2003, giving activists a chance to bring decommissioning back to the forefront of discussions.



In the meantime, other Northwest restoration projects are either inching along (in the case of the Condit Dam in Washington state) or leaping forward (in the case of the Sandy River dams in Oregon). At 125 feet high, Condit Dam on Washington's White Salmon River is poised to be the largest dam removed in the US. After earning tentative regulatory agency support for its plan to blast Condit Dam early in the year, the Portland-based utility PacifiCorp, which owns the dam, has run into opposition from local landowners concerned about the sediment trapped behind the dam.

In 1999, 21 parties, including the National Marine Fisheries Service, environmental groups and the state Ecology Department, reached an agreement supporting PacifiCorp's \$17 million plan to remove the dam rather than install a \$30 million fish ladder that may or may not work. Though the agreement expired in September 2002, none of the parties has opted to walk away, but the state is requiring more information about plans to deal with the 2.4 million cubic yards of sediment and debris behind the 89-year-old dam wall before issuing the necessary water-quality permits.



In a much clearer victory, after years of negotiations to restore the Sandy River, in October 2002 Portland General Electric, Oregon Governor John Kitzhaber and 21 organizations signed an agreement to remove Marmot Dam, Little Sandy Dam and Portland General Electric's Bull Run power facility. A new wildlife and recreation area will follow 15 miles of river, including remnants of old-growth forest, fish habitat, and scenic deep river gorges. The Portland utility will donate the lands to the Western Rivers Conservancy, following the removal of the Marmot Dam in 2007, the Little Sandy Dam in 2008, and

other components of the 22-megawatt hydro project by late 2009. The conservancy will transfer these lands to the US Bureau of Land Management and other organizations for continuous conservation.

### Dirtier Rivers Ahead?



US rivers face some seriously bad news on the policy front. The Bush administration, working through the US Corps of Engineers and the US Environmental Protection Agency, has begun reversing protections offered rivers under the Clean Water Act.

The US Clean Water Act, enacted in 1972, has been widely regarded as one of the most powerful tools available to river defenders due to its proactive mandate to "restore and maintain the chemical, physical and biological integrity of the nation's waters." Activists have made use of this act in their efforts to have dams decommissioned.

In early 2002, the Bush administration began rolling back Clean Water Act protections, allowing the continuation of activities that damage or destroy thousands of acres of wetlands and miles of streams every year. For example, it became legal for coal mining companies to bury and destroy streams with waste from mountaintop-removal mining with virtually no limits or conditions. The administration also withdrew proposed rules to reduce raw sewage discharges, dropped proposals to cut storm-water pollution from new development, and bypassed the minimum requirement that there be at least one acre of wetlands protected or created for every acre destroyed – a policy created under the first Bush administration.

Now the administration is considering proposals that would limit the scope of the Clean Water Act, leaving entire classes of waterways unprotected. If the Bush administration succeeds in gutting the Act, up to 60% of the nation's rivers, streams and wetlands – any body of water that is not "navigable" – could lose its Clean Water Act protections. This would further benefit land developers, agribusiness and mining interests, to the detriment of US river systems.

The weakening of the Act has opened the door for the Federal Energy Regulatory Commission (FERC) to ask the federal courts to rule that the Clean Water Act does not apply to hydropower dams at all. Hydropower

dams can impact downstream water quality, and there is a substantial body of law supporting the regulation of hydropower dams under the Clean Water Act. Dams can deplete dissolved oxygen in the water, suffocating fish and other species, or increase dissolved nitrogen in the water, which poisons aquatic life. Dams can discharge unnaturally cold or warm water, and dramatically alter downstream habitat with sudden surges released to meet peak demands. "It's not so much that we're afraid they'll win, it's that we can't believe they even asked," said Andrew Fahlund, senior director for dams at American Rivers.

### Canada's Quandary

Canada's rivers have had an equally tumultuous ride. From Québec Premier Bernard Landry's declaring open season on rivers in May 2001, to a shocking deal between Hydro-Québec and the northern Cree Indians in February 2002, the rivers of eastern Canada are clearly under siege.



Accompanied by Hydro-Québec chairman Andre Caille, Premier Landry in September 2001

announced the Quebec government's intention to spend its way out of an economic slowdown, by building a \$1 billion hydroelectric project on the Peribonka River. Landry also served notice that the 450-megawatt project is just the first in a series of hydro developments for the province. Landry said Hydro-Québec has the potential to develop an additional 10,000 megawatts of power and he intends to announce projects "in the near future." Caille said he wants to see the additional 10,000MW added to Hydro-Québec's existing 40,000MW generating base "as quickly as possible."



Quebec's Cree Nation reached an agreement with Hydro-Québec early in the year to put more large dams on major rivers inside Cree territory. Under the deal, the James Bay Cree would receive \$2.2 billion over 50 years. In return, the Cree would drop environmental lawsuits against the government totaling \$2.3 billion, and allow construction of new hydroelectric plants on the Eastman and Rupert rivers, subject to court and environmental approval. Opposition to the project claims that the Agreement In Principle between Hydro-Québec and the Grand Council was negotiated in secret, and a referendum was pushed through without adequate information or discussion by the affected communities. The Cree previously presented a remarkably united front against Hydro-Québec dams; their past efforts against Hydro-Québec

were among the greatest environmental victories of the previous decade.



Despite these setbacks, passionate, committed efforts to save rivers

throughout the region are seeing powerful results. To counter the dozens of new dams threatening eastern Canada's rivers, groups like Rupert Reverence, Eau Secours (Help the Waters), Adoptez une Rivière (Adopt a River) and the Pimicikimik Cree Nation are expressing determined and creative opposition. These and other groups have been organizing rafting and kayaking trips, publicizing "adoptions" of local rivers by popular celebrities, filing lawsuits and forming partnerships across the region to save rivers they consider national treasures.

For groups like Eau Secours and Adoptez une Rivière, who have been fighting the construction of dozens of small dams proposed in 2001, a recent announcement that the Québec government is banning future construction of small dams as part of a new water policy represents a huge victory. However, Québec Premier Bernard Landry made it clear that the province "has more room to maneuver with large hydroelectric projects" since signing the deal with the First Nations allowing large dam construction on their land. For Rupert Reverence, the announcement represents an increased threat to rivers they deem national treasures. "We exhort environmentalists, lovers of rivers and the artists who have adopted them to continue their extraordinary crusade," the group states. "Another battle is coming. Now that our chapels, the charming waterfalls that grace our villages, are safe, we must turn our attention to saving the majestic cathedrals that are now in great danger."



The River Recovery movement in British Columbia also continues to gain momentum with more plans announced to decommission obsolete dams. River Recovery, an umbrella organization representing 40 groups with 120,000 members, seeks to restore the ecological health of British Columbia's rivers by identifying dams that require alteration or removal. The project will also identify a range of options in addition to outright removal, including physical



Young Canadian activist with sign urging "Waterfalls Free of All Dams."

Photo: Alain Saladzius, Adoptez une rivière

modifications and water use planning schemes, which leave dams intact and functioning.

The most recent recovery news is BC Hydro's proposal to dismantle the Coursier Dam on Cranberry Creek. Dismantling the 19-meter high dam will eliminate safety concerns, restore natural flows to Cranberry Creek, and enhance fish and wildlife values.



The BC government stated its intention to come forward with a Living Rivers Strategy prior to the last provincial election in 2001.

This past September, the Minister of Water, Land and Air Protection, Joyce Murray, announced the establishment of a new Living Rivers Trust (which the government kick-started with an initial \$2 million donation). A discussion paper outlining the government's plan for a Living Rivers program should be released early in the new year.

Throughout North America, groundwork is being laid for river management policies and practices to improve. The overwhelming message of all this news from North America is that, when the politics turn against rivers, it's up to the people to defend them. While the need seems particularly acute now, in reality, it has always been up to us. As long as river defenders remain vigilant, dedicated and hopeful there will always be good news to report. ■

# HARVESTING RAIN, TRANSFORM

**A**s an advocate for sustainable water management, I have written many words in recent years promoting the virtues of rainwater harvesting. I've championed it at international conferences. I've visited projects on the ground. I've met its most famous practitioner, Indian activist Rajendra Singh, and seen his impressive slide show about the work of his organization Tarun Bharat Sangh (TBS).

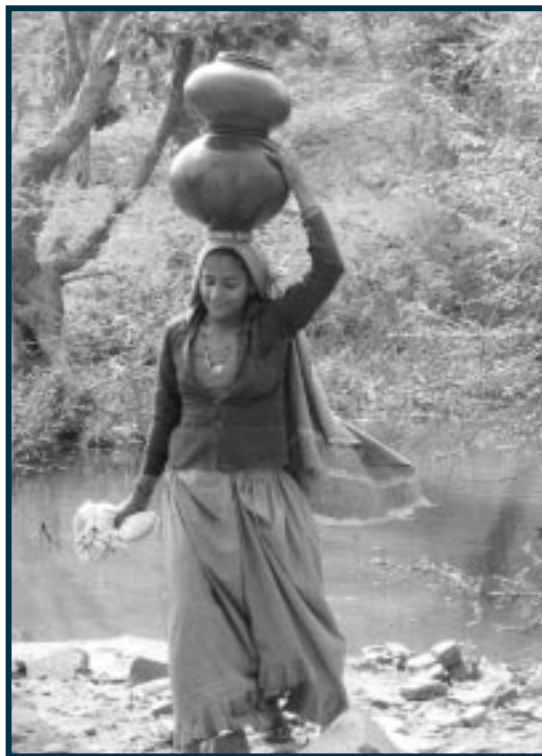
But I was still astounded during a recent visit to Singh's home state of Rajasthan to see first hand just how profoundly the work of TBS has improved the lives of hundreds of thousands of people. I was also astounded to learn that this social and environmental transformation has been achieved at a tiny fraction of the economic – not to mention human and ecological – cost of providing water services with big dams.

"Generations before us never had the good fortune we have," Lachmabai, an elderly woman from Mandalwas village, told me as we sat on the edge of a large pond created by a newly built earth embankment. "Because of the water we are happy, our cattle are happy, and the wildlife is happy. Our crop yields have gone up, our forest is green, we have firewood, fodder for our cattle, and we have water in our wells."

The people of Mandalwas have built 45 water harvesting structures in the past 15 years, and more are planned. Whereas before farmers had only enough water for grains, now people can grow water-thirsty vegetables and cash crops. Villagers who were forced to survive on one meal a day now eat two to three times a day, and have a greater variety of more nutritious food. Women's chores of fetching water, firewood and fodder, and grazing and watering cattle have become much less time-consuming. The increased availability of fuelwood and tree leaves for fodder are key benefits of forest regeneration.

The water benefits I was witnessing came despite the region suffering one of its driest years in living memory, with some villages getting only a tenth of "normal" rainfall – and this on top of three previous years of drought. According to the Indian People's Union for Civil Liberties, drought contributed to at least 40 starvation deaths in southeast Rajasthan in November. Many people are reported to be surviving by eating grass. The contrast between TBS-improved

## India's Stellar Water-Harvesting Movement Inspires Hope



A woman gets water from the Arvari River, which has been rejuvenated by local water harvesting efforts. Photo: Patrick McCully

areas and other regions of Rajasthan is to say the least striking.

Mandalwas is just one of more than 1,000 villages where Tarun Bharat Sangh ("Young India Association") is working. Since 1986, TBS has helped villagers build or restore nearly 10,000 water harvesting structures in Alwar and neighboring districts in the hardscrabble Aravalli hills of northeastern Rajasthan, a few hours south of Delhi. Many additional structures have been built by villagers without TBS involvement. Villagers have also dug more than 1,000 wells to take advantage of the resulting rise in groundwater levels.

While water harvesting is central to TBS's success, it is only part of the reason why the organization has had such far-reaching

impacts. By bringing villagers together to solve their severe water problems, TBS has empowered them to take control of other aspects of their lives. The results are seen in village rules to protect forests, in villagers uniting to force the government to provide teachers for their schools and to resist officials' demands for bribes, and in the widespread uptake of organic farming and improvements in traditional and modern health care practices.

Rajasthan is one of India's poorest states, and one of the most backward in terms of women's rights. TBS has created women's groups in a dozen villages and enabled them to play a more active role in village decision-making. Because of TBS, women are for the first time educating their daughters, stopping child marriages, and dropping the local custom of purdah (covering their faces in public). Kajoriben, a feisty woman activist from Rajaur village, told me that she had helped set up six women's savings groups in Rajaur and the neighboring village.

### Catching the Monsoon

The water harvesting structures are mainly crescent-shaped earthen embankments (known as *johads*), or low, straight, concrete-and-rubble "check dams" built across seasonally flooded gullies (nals). *Johads* have been built in Rajasthan for hundreds of years but many fell into disrepair during the 20th century due to the increasing role of the state in water management (and its fixation on large-scale projects) and the consequent weakening of village-level water management institutions and practices.

Monsoon rains fill ponds behind the structures. Only the largest structures hold water year round; most dry up six months or less after the monsoon. Their main purpose,



# IVING LIVES

## vesting

by Patrick McCully

however, is not to hold surface water but to recharge the groundwater beneath. Water stored in the ground does not evaporate or provide mosquito-breeding habitat, is protected from contamination by human and animal waste, and spreads out to recharge wells and provide moisture for vegetation over a wide area.

Several watercourses that had in recent decades held water only after monsoon storms now flow year-round due to the recharged groundwater (although parts of the rivers are drying up again due to severe, extended drought). Forests have regenerated because of the raised water table and because the need to protect forests is a key part of TBS's message. A recognition that good water management requires good land management is one reason for TBS's amazing success: among the benefits of regenerating forests on the rocky slopes of the Aravalli hills is that vegetation slows down run-off and reduces erosion, thus improving groundwater recharge and decreasing sedimentation of the villagers' ponds.

The beneficiary villagers contribute a quarter to a third of the cost of water harvesting structures in both cash and kind. In-kind contributions are normally in the form of free labor but they also can include construction materials and the value of land taken up by the structure and its pond. TBS contributes the remainder of the cost.

All the labor on the water harvesting structures is provided by local villagers. Apart from their in-kind contribution, they are paid for this work, meaning that construction brings cash into the villages. Funding for TBS has come from numerous sources including the Ford Foundation, Oxfam, various European government agencies, and the Indian and Rajasthani governments. With the exception of Rajendra Singh, who is from nearby Jaipur, all the TBS staff come from the villages in which the organization works. In addition to the full-time staff there



Rajendra Singh beside a check dam. Photo: Patrick McCully

are 230 part-time workers and thousands of volunteers helping to design and build structures, plant seedlings, protect forests from grazing animals and fuelwood collectors, and spread the TBS message to other villages.

### Sharing the Water with Wildlife

Alwar is home to one of India's best known wildlife reserves, the Sariska Tiger Sanctuary. TBS has built numerous structures in the "buffer zone" around the sanctuary as well as inside the reserve itself. At first, sanctuary officials were hostile to TBS. But now they encourage TBS's work, realizing that the group has not only provided water sources for wildlife and helped regenerate the forest, but has also persuaded villagers to stop poaching. Furthermore, after a hard-fought struggle, including a case in the Supreme Court, TBS forced the closure of stone quarries that were causing considerable environmental damage inside the park (including lowering the water table and so diminishing the benefits of water harvesting). Thanks to reduced poaching and increased prey animals, the number of tigers has increased in recent years from 18 to around 25.

The most remarkable illustration of the Alwar villagers' enjoyment of the ecological benefits of water harvesting is the "People and Wildlife Sanctuary" created by the people of the twin villages of Bhaonta and Koylala. I walked up the narrow, rocky gully to the 12-meter-high Sakarawala dam, which marks the end of the sanctuary, with a group of village elders, the designers and builders of the dam.

The rules for the protected area are painted on the face of the stone-and-concrete buttress arch dam. Among the rules are "no hunting in this forest created by god," "without permission of the *gram sabha* (village council) and *sarpanch* (headman) no tree

may be cut because there is god in trees," "do not allow cattle, goats or your camels to destroy the forest," and "every drop of water in the watershed of this village should be made available to the wildlife and cattle of the village."

I sat on top of this dam and listened to the elders talk excitedly about the animals they've seen in the sanctuary – including wild boar, hyena, monkeys,

jackal, numerous types of deer and leopard. And although none of them have seen one, they told me with great pride that they'd found the tracks of a tiger beside the pond and that these had been officially noted by the state wildlife department. The villagers say that none of these animals were seen near the village before they started water harvesting and forest protection.

The people of Bhaonta have played a key role in an exciting local initiative in participatory river management. The Arvari River has become perennial in all but the driest years because of water harvesting. Villagers living in the Arvari watershed decided that they should draw up rules to ensure that the newly flowing river did not become over-exploited and to encourage forest protection. In 1999 representatives of village councils from 34 villages met and formally declared the creation of the Arvari Parliament.

Seventy-two villages now send representatives to the parliament. Besides dealing with forest and water use issues it has also forced the state government to rescind a license it had given to an outside contractor for fishing rights in the Arvari. While it has no legal authority, the parliament has the moral authority to be able to impose fines on rule-breakers and to resolve resource-use disputes between villages.

### The Large Benefits of Small Things

Despite only minimal government support – and often in the face of outright official hostility – TBS's structures have provided irrigation water to an estimated 140,000 hectares. TBS calculates that around 700,000 people in Alwar and the neighboring districts benefit from improved access to water for household use, farm animals and crops. Each structure is small-scale, but the total benefits of TBS's work are most certainly large-scale.

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# Continent-Wide Development Plan Targets Africa's Rivers

by Ryan Hoover

**A**frica's rivers have been relatively untouched by large dams, given the continent's large hydroelectric potential. According to the editors of *Hydropower Review Worldwide*, over 370,000MW could still be tapped from the continent's rivers. But a number of factors, including the slow pace of development across much of the continent, widespread poverty and a generally risky investment climate, have conspired to keep many of the dam industry's plans for Africa's rivers from being realized.

But now a plan has been put forth that could pose a serious threat to Africa's mighty rivers and the communities that depend on them. In October 2001, African leaders endorsed a development agenda that called for rapid integration with the global economy and increased privatization as a means to fight poverty on the continent. This plan, called the New Partnership for African Development (NEPAD), was warmly received by leaders of the developed world. Setting itself up as a vehicle to promote investment in large infrastructure projects, NEPAD has major implications for dam-building on the continent.

Instead of individual countries promoting their own national projects, NEPAD works regionally to coordinate and prioritize projects with the potential to deliver region-wide impacts, for example a hydroelectric project intended to supply electricity to several neighboring countries. In this way, finite amounts of development assistance are targeted at a few key projects. This has the effect of fast-tracking a number of potentially-destructive dam projects. It also provides new impetus to grid-extension initiatives like the Southern African Power Pool, which put hydroelectricity at the center of new power generation on the continent. Patrick Bond, professor at Witwatersrand University, notes, "Nepad offers a new lease on life for corporate construction and international financiers, but it will in particular advance the South African dam-building industry's interests."

At least 13 dam projects have been slated for promotion through NEPAD. Below are a few examples:

## **Mepanda Uncua Dam, Mozambique**

At the top of NEPAD's energy sector priority list is a large dam on the Zambezi River, Mozambique's Mepanda Uncua hydroelectric project. Primarily intended to export peaking

power to neighboring South Africa, Mepanda Uncua would displace some 1,400 people who have recently returned to the area following Mozambique's bloody civil war. It would also create serious problems for communities situated downstream. Because the dam would generate more power during certain times of the day than others, every day it will release a mini-flood of water that will disrupt fisheries, navigation, and agriculture for many kilometers below the dam. Many thousands of people would be affected by these floods. The full extent of these impacts was not sufficiently studied during the project's recently completed feasibility study.

The project's problems are not only social and environmental. Mepanda Uncua is also of dubious economic value. The US\$1.7 billion dam would be built approximately 70 kilometers downstream from the giant Cahora Bassa Dam. This 2,000 megawatt (MW) dam, built by the Portuguese during the colonial era, is still some \$2.5 billion in debt and has had difficulties selling its power at a fair price. Eskom, South Africa's power utility, has long refused to even pay a third of a US cent for a kilowatt-hour from Cahora Bassa, one of the lowest rates anywhere in the world. The dispute resulted in the dam's owners cutting off all power deliveries to Eskom in October. Eskom appeared to take little notice. It reported that it will have a power surplus for many years even without Cahora Bassa's contribution. Given that Mozambique's domestic energy needs are very low and can be easily met by Cahora Bassa's production, the need for Mepanda Uncua is at best unclear.

## **Grand Inga Hydroelectric Project, Democratic Republic of Congo**

At the same time that it fends off price hikes at Cahora Bassa, South Africa's Eskom is attempting to drum up support for another mega-dam on the other side of the continent. One of NEPAD's primary goals is the completion of a continent-wide electricity grid. It is envisaged that the Grand Inga Hydro Project on the Congo River in the Democratic Republic of Congo (DRC) would be at the center of this grid.

Grand Inga would be the largest hydroelectric project anywhere in the world. With a proposed generating capacity of 44,000MW, it would dwarf even China's gigantic Three Gorges Dam. Proponents hope that the dam would effectively become the energy provider for the entire African continent, with power



*South African President Thabo Mbeki has been a prominent champion of NEPAD.*

left to spare for export to Europe and the Middle East.

Little is known about the design specifications of this massive project, and thus its specific social and environmental impacts are uncertain. This much is public, however: it will involve 52 separate power plants (many of them nearly the size of Mepanda Uncua), and reservoirs will need to be created which will result in downstream impacts and the displacement of local people.

The project would be fraught with economic and political risk. The \$6 billion project would also require a \$10 billion investment in new and improved transmission infrastructure. Thus far, Eskom is the only investor to express a real commitment to the project, but its proposed \$450 million contribution falls far short of the project's cost.

## **Souapiti & Kaleta Dams, Guinea-Conakry**

Guinea-Conakry is promoting two dams through NEPAD. The proposed Souapiti and Kaleta dams, which both date back to the colonial era, would be built on the Konkouré River and are proposed to supply 975MW of electricity to an aluminum smelter belonging to the Guinea Aluminum Products Company.

The combined area of the dams' reservoirs would amount to 780 square kilometers, and the consultants that designed the dams have warned that this much stagnant water will spark the reemergence of water-borne diseases like malaria, river blindness, and bilharzia.

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Souapiti and Kaleta would also forcibly displace many thousands of people. The project promoters estimate the dams would require the resettlement of 75,000 people, a figure comparable to the numbers displaced by Ghana's giant Akosombo Dam.

Nevertheless, the global aluminum industry remains hungry for inexpensive electricity, and private financing may emerge for these destructive projects which are estimated to cost some \$2 billion. The United States Trade and Development Agency financed the project's feasibility study and is promoting the project with potential US investors.

### **Adjarala Dam, Benin**

With a generating capacity of only 98MW, the Adjarala Dam proposed to be built on the Mono River in Benin is a relatively small project. Its resulting social impacts, however, would be major.

According to the project's World Bank-financed environmental impact assessment,

the project would displace 5,300 people, a huge amount for such a small dam. In addition, like Souapiti and Kaleta, health experts believe that it would increase the risk of waterborne diseases like bilharzia.

Due to the government's lack of success in attracting financing from the World Bank for the project, it is now seeking private investors through NEPAD.

### **Conclusion**

African leaders claim that NEPAD is not only about promoting large infrastructure development, noting that it also commits African governments to promote human rights, protect the rights of minorities and women, and prevent the over-exploitation of natural resources. Some observers feel this will in fact open enough political space for concerned citizens and NGOs to ensure that destructive infrastructure projects are kept off the NEPAD docket.

Others disagree with this point of view.

Professor Bond says, "NEPAD promotes citizen participation in development decision-making only insofar as anti-NEPAD gatherings have been held by civil society. This should hasten work on an alternative, what has already been termed an "African People's Consensus," which would put forth a truly pro-people and environment development strategy."

Still others believe NEPAD's impacts will vary from country to country. Dr. Assitou Ndinga, coordinator of the African Network for the Monitoring of Investments and Projects, says "NEPAD will open a large space for civil society participation in decision-making in countries with a tradition of democratic decision-making such as Senegal, but not in Chad, for example."

In any event, because NEPAD may bring new life to long-dormant and potentially destructive dam projects, it bears vigilant monitoring – of both the types of development it promotes and the quality of citizen involvement it allows. ■

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## **Africa's Renewable Potential Shines**

by Ryan Hoover

**N**EPAD may be giving a new lease on life to large-scale dam projects, but African nations are also demonstrating increased willingness to explore renewable alternatives.

Because Africa does not have extensive energy infrastructure based on traditional fuels, it has little vested interest in propping up these industries. It thus has the opportunity to make significant investments in renewable energy technology.

Below are a few examples of renewable energy's potential in Africa, and steps that some countries are taking to harvest it.

### **Geothermal**

Producing energy from heat generated below the earth's surface holds significant potential in many African countries, and its operating and environmental costs are currently lower than all other renewable energy sources. East Africa is already beginning to make use of its geothermal resources. Over 18% of all electricity generated in the region comes from geothermal power plants. Kenya will soon have more than 100MW of generating capacity from its three geothermal stations around the Olkaria Volcano. The government estimates that Kenya could produce up to 2,000MW entirely from geothermal sources. Other significant potential exists in Djibouti, Ethiopia, Uganda and Zambia. Geothermal energy is very site-specific and

harnessing it requires considerable initial investment, but its low environmental impact combined with the fact that it is available 24 hours a day, 365 days a year make it a very economic energy alternative.

### **Wind**

Africans have harnessed wind for many years to power water pumps. Now, with advances in technology leading to rapidly decreasing costs per kilowatt hour, some countries have serious plans to use wind to generate electricity. In North Africa, Morocco, Egypt, and Namibia have all embarked on 20-100MW wind projects, with Egypt hoping to install 600MW by 2005. Ghana is considering construction of a 50-60MW wind farm. The African country with the greatest wind potential is South Africa. With average wind speeds ranging between 7 and 9 meters per second, some experts believe the country has the potential to build 4,000MW of wind capacity by 2020. One of the technology's main drawbacks is that the wind does not always blow when electricity is needed, but when it is included in a mix of other energy sources this clean and renewable resource can considerably reduce dependence on fossil fuels and hydroelectricity.

### **Biomass**

Biomass-fueled power plants convert crop residues, wood, manure, or even trash into

electricity. These plants are small, and quite appropriate for supplying off-grid towns and villages. Mauritius and Swaziland use biomass as an adjunct to coal to produce 25-30% of their total electricity. Other African countries, especially those with large sugar or timber industries, have considerable scope to also exploit biomass. Data from the Food and Agriculture Organization suggests that Ghana, Cote d'Ivoire, Cameroon, and Nigeria all have market potential to develop at least 70 small (about 3MW) biomass plants.

### **Solar Thermal**

With Southern Africa receiving 59% of the earth's highest quality sunshine, the region's solar thermal energy potential is considerable. Solar thermal projects use the sun's rays to heat a fluid (typically) which creates steam to turn a generator. Projects like these are not feasible everywhere. They are expensive, and require a certain quality of light and typically a dry, arid climate. South Africa, which has a climate well-suited to solar thermal generation, is interested in exploring its possibilities. The national energy utility Eskom has already installed a pilot 25kw solar thermal plant at the offices of the Development Bank of Southern Africa, and it has plans to construct a 100MW facility in the near future. An even more ambitious plan is underway in South Africa's Northern

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# Latin American Rivers Endangered by Regional Development Schemes

by Monti Aguirre

**F**rom the Lacandon rainforest of Mexico and Guatemala to the Amazon and La Plata rivers in Brazil, governments and multinational companies have plans to exploit the hydroelectric potential of the region's mighty rivers and carve water highways through their basins.

Clearly, the era of large dams is not over in Latin America. There are plans for hundreds of dams in the region, including more than 400 in Brazil (and at least 50 of those, proposed for the Tocantins and Araguaia rivers, three of which would power energy-hogging aluminum smelters exclusively); 70 in Chiapas state in Mexico, five of those on the Usumacinta River; 100 planned in Costa Rica, including the 1,400MW Boruca Dam on the Térraba River; 13 in Nicaragua; four more on Chile's Biobio River and six more on southern Chilean rivers.

River channelization projects threaten to carve up the region's rivers into industrial "highways." The combined effect of these projects would be to blast, dredge and straighten many thousands of miles of natural riverbeds across Latin America to accommodate large ships year-round. Virtually all of the proposed projects are in indigenous peoples' areas. Harmful channelization projects continue to make progress, including the Paraguay-Paraná Hidrovía, which could have irreversible impacts on the world's largest wetlands, the Brazilian Pantanal, and other valuable ecosystems in Bolivia, Paraguay, and Argentina; a grandiose scheme to connect the Orinoco, Amazon and La Plata river basins to benefit the agribusiness and timber industries; a "multi-purpose" channelization and hydro scheme for Colombia's Guamués River, and two massive projects in Brazil's Amazon.

"Rivers are being destroyed because of a lack of awareness and respect for the value of rivers in maintaining ecosystems and contributing to the lives of riverine populations – that, combined with a healthy dose of plain greed. The result is expensive, environmentally damaging boondoggles that enrich a small elite while displacing thousands of people, driving many to absolute poverty," said Glenn Switkes from IRN.

Latin America has enormous hydropower potential and untapped raw materials, and local governments and international finan-

cial institutions are working to attract multinational companies to further exploit the region's natural riches. As part of its efforts to make the region more attractive to multinationals, two brazen plans have been conceived by local governments working with industrial leaders. They are the Infrastructural Regional Initiative for South America (IIRSA) and the Plan Puebla Panama (PPP).

Financing for both plans comes principally from the Inter-American Development Bank (IDB). Other financiers include the World Bank, the Central American Development Bank, the Andean Development Corporation, the United Nations Development Programme, and export credit agencies of developed countries, all of which will receive substantial economic benefits from these projects.

IIRSA proposes the linking of electrical grids from less industrialized countries to more industrialized countries. These electrical connections take advantage of hydropower and gas from countries like Bolivia or Ecuador to supply energy to more energy-intensive economies like Brazil and Peru.

"IIRSA's projects are being done with no consultation and with minimal information released to the public, such as how the regional environmental and social standards will be maintained," said Switkes.

The PPP is IIRSA's counterpart in Mexico and Central America. One of the main components of the PPP is the expansion of the electrical grid throughout the region to attract the participation of the private sector in the development of the electricity sector. "The structure of the markets should allow private investment, particularly in generation, which allows ... energy competition, and reduction of energy tariffs for the benefit of all the inhabitants in the region," according to a document of the IDB.

But according to Gustavo Castro from the Center of Economic and Political Community Action in Mexico, "The objective of the PPP is to create one electricity law for the entire region with one administrator, one agency, one integrated grid system which will supply the United States with energy from hydroelectric dams or gas coming from our countries. This plan has been drawn up to respond to the demands of the transnational companies and not to meet the demand of the region."

Projects such as the Boca del Cerro Dam on Mexico's Usumacinta River, one of the bigger dam projects associated with the PPP, have spurred the emergence of a new anti-dam movement in the region. Indigenous communities on both sides of the river have organized into regional committees and began to conduct studies on the foreseeable impacts of this dam, which threatens to flood a large number of Mayan cultural sites.

The Maya Biosphere Reserve in Guatemala, which is the largest wetland reserve in Central America, would be affected by various PPP projects. This 13-square-mile reserve is home to 3,000 plant species, the endangered jaguar and the scarlet macaw.

Regional economic agreements which seek to protect trade and foreign investment from regulation by liberalizing public services such as water, health, electricity, education and telecommunications; modifying legal frameworks and removing tariff barriers – all complement the IIRSA and PPP initiatives.

Both plans will create *maquilas*, or sweatshop, jobs. The pool of workers for the *maquilas* will be the peasant and indigenous peoples displaced by the plans' dams, roads and other infrastructure projects. Sweatshops lack health and safety requirements and labor rights, and there is no transfer of technology to host countries. "These populations will go from owning their lands and producing their own food, to being employed at cheap labor sweatshops, in need of paying for housing and food," said Castro.

## Speaking Out

Latin America is already home to a widespread, strong and diverse river-protection and anti-dam movement. But new projects are fomenting further opposition locally. Communities across the region are demanding that their voices be heard before development schemes are approved. Civil society in Mexico, Guatemala, Belize, El Salvador, Honduras, Nicaragua, Costa Rica and Panama have created national citizens' committees to address issues concerning the PPP, including dam impacts. Mexico's citizens created the Mexican Alliance for the Self-determination of Peoples, Guatemala the Global Roundtable, El Salvador the Salvadorian Social Movement and Honduras the Popular Front. On October 12, 2002 indige-

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nous peoples, peasant and their supporters from Latin America and the United States protested at IDB and World Bank offices throughout cities in the Americas against dams and other infrastructural projects proposed under the PPP. Representatives of 150 communities from Chiapas protested the 70 dams proposed for that region by blocking the Panamerican highway for 24 hours. The groups are also drawing attention to the inequities of the North America Free Trade Agreement (NAFTA), the Free Trade Area of the Americas (FTAA), and the Central American Free Trade Agreement (CAFTA).

In anticipation of the Lula government taking power in Brazil on January 1, 66 activist organizations in December called for a moratorium on new hydroelectric concessions in the Amazon, and for a freeze on

those already moving forward in the licensing process. They are counting on the fact that Brazil's environment ministry will be led by Marina Silva, who has a long history of fighting for protection of the Amazon, and that there will be greater public debate on possible energy futures for the country.

### Debts of the Past

While new projects are being planned, communities that were affected by past dams continue to seek restitution. Plans to raise the water levels of the 50-year-old Miguel Aleman Dam and the 28-year-old Cerro de Oro Dam in Mexico have created outrage in previously resettled communities that have still not been adequately compensated for their losses to these two projects, and which still lack land titles in the

resettlement zone. Communities, which are still owed 170,000 hectares as promised when Cerro de Oro Dam was built, may again face displacement.

The former Maya Achi communities in the Rio Negro area of Guatemala who were affected by construction of the Chixoy Dam – 400 people from the area were massacred during the military regimes for opposing dam construction – are in the process of preparing their legal case and conducting a socio-economic study of the damages and losses. The case will be presented at international courts and demands will be made to the Inter-American Development Bank and the World Bank, financiers of the project, as well as to dam construction companies. This case could be precedent-setting for other dam-affected communities. ■

### China Report continued from page 3

Gorges project has become “an instrument of repression with widespread human rights abuses.”

The Three Gorges Dam could not be built without support from international financial institutions. Five official export credit agencies have approved more than \$1.4 billion for the project. Foreign banks have issued bonds of close to \$2 billion for the China Development Bank, a financial intermediary that has Three Gorges Dam as its top loan commitment. Being so involved in the project's financing and construction, the banks, export credit agencies and the governments that back them share in the responsibility for the impacts of the Three Gorges Dam, including the resettlement problems and human rights violations.

Some observers argue that the large-scale resettlement for the Three Gorges Dam is part of the unavoidable cost of modernizing China's economy. The countless victims of the project can no longer count on state support in the form of land or jobs in a centrally planned economy. What critics forecasted for the Three Gorges project in 1989 is now coming to pass: spiralling costs, lack of flood control viability, and major resettlement difficulties.

### A Need For Action

Through their export credit agencies, five Western governments – Germany, Sweden, Switzerland, Brazil and Canada – are heavily involved in Three Gorges Dam construction. As submergence draws closer, these governments should urgently press for the following measures to be taken:

- The Three Gorges Dam is not only a national project, but also a global undertaking. The local counties are unable to resolve the massive resettlement problems that they have been forced to shoulder. The national authorities must assume the responsibility for resettlement in the Three Gorges project.
- Affected people must be resettled, compensated and rehabilitated in line with acknowledged international standards. The state must ensure that, as these standards stipulate, resettlers receive compensation at full replacement cost, and be able to improve or at least regain their former standard of living.
- The state should create independent grievance mechanisms for the people affected by the project. People should not suffer repression for expressing their opinions, protesting peacefully, or for seeking redress for damages they have suffered. People who have been imprisoned for peaceful protest against the problems of the project in the past should be released.
- As long as the problems of resettlement have not been resolved in line with international standards, the submergence of the reservoir area must be suspended. Numerous World Bank evaluations have demonstrated that an approach of resettling people while a project is being implemented is not effective.
- The governments who share responsibility for the Three Gorges project should establish a presence in the project area during this critical stage, and should monitor the implementation of the project and the resettlement efforts. While

Chinese authorities have invited foreign experts to monitor the construction standards of the Three Gorges Dam, they should also invite independent human rights experts to monitor resettlement.

Governments that give corporate charters to investment banks, and those with export credit agencies, should also ensure that human rights are protected in their financing decisions more generally:

- Export credit agencies and corporate financial institutions should carry out social impact assessments before taking decisions on underwriting, and extending credits and guarantees. Where relevant, these assessments should completely disclose the human rights conditions in the covenants of their credit and guarantee agreements, and monitor compliance to these covenants during project implementation.
- The World Commission on Dams (WCD) has proposed a framework that integrates human rights into the planning and decision-making processes of water and energy projects. The WCD recommends that “demonstrable public acceptance of all key decisions” be achieved through open and transparent negotiations with the participation of all stakeholders. The WCD also recommends a “comprehensive post-project monitoring and evaluation process,” and mechanisms to identify and remedy outstanding social issues associated with existing dams. Export credit agencies and investment banks should adopt these and other recommendations of the WCD. ■

**Climate** continued from page 1

Germany alone is set at around US\$9 billion. Nearly a fifth of all farmland in the Czech Republic is reported to have been flooded. Millions living in northeast India and eastern Nepal were also affected by floods in 2002.

The reasons why flood damage is increasing around the world are complex and include factors such as land degradation, bad urban planning, and ironically, the counter-productive results of building dams and embankments for flood control. However, increasingly intense rainfall is also without doubt a major culprit.

While it is not possible to say that any particular extreme weather event would not have occurred in the absence of greenhouse gas pollution, the pattern of increasingly severe hydrological disruptions is consistent with climate change science. And as the earth's atmospheric composition and temperature has already been substantially changed by greenhouse gases – with an increase of around 0.6 degrees centigrade since 1860 – it is reasonable to say that all weather we are now experiencing, extreme or not, is in some way influenced by global warming.

Reduced precipitation coupled with rising temperatures are causing an alarmingly rapid shrinkage of glaciers around the world, and especially in the tropics. Ice fields covering the peak of Kenya's iconic Mount Kilimanjaro have shrunk by 80% since it was first mapped in 1912. Unless the rate of shrinkage slows, the snows of Kilimanjaro will be gone within two decades.

The *New York Times* reported in November that the mass of glaciers and snowcaps in the Bolivian Andes has shrunk by 60% since 1978, and those in Venezuela are “nearly extinct.” In many parts of the world, glaciers and snow pack act as water towers, storing winter precipitation and releasing it gradually through the summer melt. The *Times* points out that the disappearance of Andean glaciers “could lead to water shortages in places like Bolivia and Peru that depend on glaciers and the rain and snow that fall on the mountains for water for drinking, irrigating fields and generating electricity.”

### Impacts on Hydropower

Models of the impacts of climate change on the west coast of the US and Canada also predict serious reductions in water supplies due to shrinking snow packs. A recent study sponsored by the US Department of Energy (based on one of the most conservative climate models) predicts that even if total precipitation remained the same, warmer tem-

peratures would mean that the snow pack in the Pacific Northwest could be halved by 2050. This would reduce the spring flow of the Columbia river by 20%, with major implications for hydropower, irrigation and water supply.

As a general rule, a decrease in run-off produces a greater decrease in hydropower production. Not only is there less water to go through the turbines, but lower reservoir levels reduce water pressure and, thus, the amount of energy in the falling water. According the US Environment Protection Agency, a 10% decrease in runoff in the lower Colorado River (in the US Southwest) would reduce power production by 36%.

The *New York Times* reported on December 9 that drought in 2002 had reduced US hydro production by nearly one-quarter. A reduction in hydropower generation due to drought in the Pacific Northwest was one of the reasons behind California's “energy crisis” of 2000 (along with market manipulation by power companies). Drought also forced blackouts and energy rationing in heavily hydro-dependent Brazil in 2000-01. Other countries that have suffered serious drought-induced power reductions in recent years include Albania, Brazil, Chile, Colombia, Ecuador, Georgia, Ghana, Guatemala, Iraq, Kenya, Mexico, Peru, Sri Lanka, Tajikistan, Thailand, Vietnam, Zambia and Zimbabwe.

Norway is one country where energy planners are actually hoping to benefit from climate change. Norway generates almost all of its electricity from hydropower, and climate models predict that the country will get wetter. Yet the Norwegian energy sector is now experiencing the consequences of one of the few certainties about global warming – that it makes things more uncertain. Norway is now suffering a drought that has cut reservoir levels to 20% below normal. In early December Norway's energy minister announced that he could not rule out energy rationing this winter.

Countries and regions that are heavily dependent on hydropower are especially vulnerable to global warming – at the same time as droughts reduce their agricultural production, they would also face cutbacks in industrial and other areas of their economy due to energy shortages.

### Mitigation Madness

The need for all countries to take measures to reduce their vulnerability to climate change was one of the main issues discussed at the October UN climate conference. The “Delhi Declaration,” adopted at the end of

### What is IRN Doing?

IRN is working with CDM Watch and other groups to ensure that large hydropower projects are excluded from the Clean Development Mechanism, and that small hydro projects are restricted to those which comply with the recommendations of the World Commission on Dams. “Meeting these conditions is a must if the CDM is to meet its twin mandate of reducing greenhouse gas emissions and promoting sustainable development,” says CDM Watch's Pearson.

IRN is also working to raise awareness about the climate impacts of hydropower, as covered in past issues of *WRR* (April 2001). See [www.irn.org](http://www.irn.org) for our June 2002 report “Flooding the Land, Warming the Earth: Greenhouse Gas Emissions from Dams.”

the meeting, notes that “Developing countries are particularly vulnerable, especially the least developed countries and small island developing States.”

While “adaptation” to a changed climate was a hot issue at the Delhi summit (see page 2 for an editorial on this), there was also a widespread recognition – with the notable exceptions of the US, Saudi Arabia and other OPEC states – of the need for more actions on climate “mitigation,” in other words reducing climate pollution. By the rules of the Kyoto Protocol, at least 55 countries representing 55% of total carbon dioxide emissions must ratify the treaty in order for it to become legally binding on the signatories. Despite the withdrawal of the US, this threshold would be passed with ratification by Russia, whose signature is expected sometime in 2003. The impending enforcement of the Protocol focused the attention of conference delegates on the workings of the Protocol's carbon-trading mechanisms. These mechanisms are supposed to cut the costs for developed countries of meeting their emission-reduction targets under the Protocol.

The new report “Damming the CDM” (available at [www.irm.org](http://www.irm.org)) analyzes the use of hydropower projects in the Clean Development Mechanism (CDM). The CDM is a Kyoto Protocol effort which promotes carbon-reducing projects in developing countries. Developed countries subsidize these projects by purchasing carbon credits from them. The credits allow buyers to reduce by

*continued opposite*

**Climate** continued from page 14

an equivalent amount of carbon the emission cuts they have to make domestically.

The report shows that big hydro threatens the effectiveness and credibility of the CDM, and will provide carbon-reduction credits for projects that do not actually reduce emissions. Of the 30 projects so far proposed for credits, seven are large hydropower schemes. These large hydros make up nearly 40% of the potential emission reduction credits. New renewable projects, by comparison, make up only 20% of the claimed credits.

Most of these large hydro projects are already under construction or were already

planned to have been built regardless of receiving carbon credits. They are thus “non-additional” in the jargon of carbon traders, meaning that they would go ahead with or without the CDM. The main result of buying these carbon credits would not be to achieve economically efficient climate benefits. It would instead be to increase the return to the project developers – mainly subsidiaries of large US energy corporations. And because the projects would have happened anyway, developing countries would receive no additional investment benefit.

“Giving these projects approval to generate carbon credits would turn the CDM into

a subsidy mechanism for hydro developers and a carbon accounting loophole for industrialized countries, instead of a tool for climate protection,” says Ben Pearson from CDM Watch.

The social and environmental damage that will be caused by some of these projects also means that they are in breach of the CDM’s mandate to promote sustainable development. In particular, the possibility that the Dutch government may source credits from the controversial Bujagali Dam in Uganda would totally undermine the credibility of the CDM as a driver for sustainable development. ■

**Water Harvesting** continued from page 9

Not a single family has been displaced to achieve these impressive benefits. Unlike big dams, the *johads* and check dams have not destroyed any rivers or submerged huge areas of forests and farmland: on the contrary, TBS’s work has actually created rivers and forests.

TBS has contributed around 70 million rupees (US\$1.4 million) in outside funding to the cost of the water harvesting structures. This works out to a cost of 500 rupees per hectare irrigated and 100 rupees (\$2!) per person supplied with drinking water. An admittedly back-of-the-envelope comparison of these costs with those of the notorious Sardar Sarovar dam project (SSP) in Gujarat state gives startling results (see chart). Taking a conservative estimate of the total cost of SSP of 300 billion rupees (\$6bn) gives a per-person cost of 10,000 rupees for drinking water supplied – 100 times more than in

Alwar. The cost of supplying one hectare with irrigation water from SSP works out to be 170,000 rupees – 340 times more than in Alwar. Theoretically, if the budget for SSP was available to TBS-type water harvesters, they could provide drinking water to three billion people (half the world’s population) while irrigating 600 million hectares (more than twice the world’s irrigated area).

Now consider that TBS started work in Alwar at around the same time as the Gujarat government started construction on SSP. The people of Alwar district have for years been enjoying the benefits of water harvesting, while all but a tiny fraction of the supposed beneficiaries of Sardar Sarovar are still waiting to see a single drop of water. Furthermore, some 40,000 people have already been forced off their lands to make way for SSP, and hundreds of thousands more face displacement if the project is ever completed.

More than a billion people are estimated to lack decent access to drinking water. The World Bank and other dam builders and water privatizers use this shocking statistic to build up the case that \$180 billion a year must be invested in the water sector and that multinational corporations are key in mobilizing this huge amount of money. But at Alwar costs, \$180 billion would be enough to supply water to 15 times the world’s current population. The needs of the one billion who lack water could be met for about the cost of a single major dam.

The draft of the new World Bank water resources strategy argues for new megaprojects by claiming that “easy and cheap” options have mainly been exploited. In reality, easy and cheap options such as rainwater harvesting have hardly even been looked at by the water Establishment.

Alwar is no utopia. It is a desperately poor region with deplorable government services and infrastructure, high levels of illiteracy and an appalling level of oppression for the majority of women. But if there is to be an answer to the acute water problems of India – and the world – I am convinced it lies with the rainwater harvesters and forest protectors of the Aravalli hills. ■

	Irrigated area (1000 ha)	Water supplied (1000 people)	Total Cost (million rupees)	Irrigation cost per hectare (rupees)	Water supply cost per person (rupees)
SSP	1,800	30,000	300,000	170,000	10,000
Alwar	140	700	70	500	100

**Africas Renewables** continued from page 11

Cape where the provincial government hopes to construct a 400MW solar tower.

**Photovoltaics**

A more decentralized method of utilizing the sun’s energy is through the use of photovoltaics, which directly convert sunlight into electricity. Because of their relatively high up-front cost, photovoltaics are most often used for small-scale, rural power generation.

Kenya is among Africa’s leaders in photovoltaic usage. More than 120,000 systems have been installed in the country since 1986. Zimbabwe has installed more than 85,000 systems. Solar water heating has great potential across the continent as well.

**Wave Power**

While unleashing the power of ocean waves and tides in a commercially viable way is

probably decades away from becoming reality, researchers believe that significant potential exists. South Africa, the only African country known to be researching its wave power potential, has wave energy of 50kw/m off its western coast. This figure suggests that, as the technology becomes more affordable, 1MW of power could relatively easily be generated from only 100 meters of wave-front. ■

# Bujagali Dam Overpriced by \$280 Million

by Peter Bosshard

**A** new study reveals that Ugandans will pay hundreds of millions of dollars in excessive power payments if the World Bank-financed Bujagali Dam proceeds according to plan. The study, which analyzed the dam's once-secret Power Purchase Agreement (PPA), was made possible after a recent Ugandan court decision ordered the public release of the document. In a landmark judgment on November 12, the Uganda High Court ruled that the contract between the project's private developer (the US-based AES Corporation) and the Ugandan government must be released. The World Bank, AES and the Government of Uganda had steadfastly refused to make the PPA available, and thereby denied the right to Ugandan citizens to understand the long-term cost implications of the project.

Bujagali is one of the most controversial dam projects in recent years. It is the largest private power project in Sub-Saharan Africa, and the largest private investment in East Africa. AES, the world's largest private power producer, has had huge financial setbacks in the past year, and is now reconsidering its

involvement. South Africa's huge state-owned power utility, Eskom, is currently considering investing in Bujagali as a joint-venture partner with AES.

NGOs have consistently questioned the economic viability of Bujagali, warning that the project may well turn into a white elephant. The new study, by Prayas Energy Group from India, substantiates those concerns and reveals how bad a deal the dam is for Ugandans. The Prayas review found that Bujagali is excessively expensive, and that the project contract contains several unusual requirements which are detrimental to Uganda. With a cost of \$2.9 million per installed megawatt, the 200MW Bujagali is more than twice as expensive as a comparably designed dam in Central India. If Bujagali goes ahead, according to the Prayas review, Uganda will have to bear an extra cost of \$280 million.

"Bujagali is not in the best interests of the Ugandan people and should be cancelled," said Frank Muramuzi of Uganda's National Association of Professional Environmentalists.

The World Bank and other public finan-

cial institutions have approved large credits and guarantees for Bujagali in the past year. The Prayas review found that the Bank provided poor advice to Uganda's government, and misled the public about the true cost of the project. The World Bank suspended all funding in July 2002, and is presently investigating the project for corruption. The Norwegian company Veidekke, the main civil engineering contractor of the Bujagali consortium, subsequently withdrew from the construction site.

The Prayas review, commissioned by IRN, demonstrates that Southern governments can strengthen their position in developing water and energy projects if they allow civil society to participate in decision-making. IRN called on the World Bank to draw a number of specific lessons from the Bujagali experience when the Prayas review was published. ■

*For more information on the review of the Bujagali contract, see [www.irn.org/programs/bujagali/](http://www.irn.org/programs/bujagali/) For a report documenting problems with PPAs in general, see [www.irn.org/programs/finance/](http://www.irn.org/programs/finance/)*

**THE YEAR IN REVIEW**

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