

Efforts to Silence Narmada Activists Grow

Indian authorities have recently stepped up attempts to silence the Save the Narmada Movement (NBA) and its supporters. A group of prominent politicians are supporting a call to "ban" the NBA, the leading group in the fight to halt big dams on the Narmada. Leading figures linked to the NBA face possible six-month prison sentences on contempt of court charges. And a campaign appears to have started to keep foreign supporters of the NBA out of India.

A body calling itself the National Council for Civil Liberties (NCCL) has submitted a memorandum to influential (and fiercely pro-dam) Delhi Home Minister L. K. Advani demanding that the NBA be banned under the 1957 Unlawful Activities Act. Five former chief ministers of the state of Gujarat and two senior politicians from Madhya Pradesh signed the memorandum. The NCCL describes the NBA's alleged subversive activities as receiving foreign funding, passing on confidential reports on important Indian projects to foreign agencies, and letting loose a reign of violence against government officials working in the valley.

Writing in the Indian news magazine Frontline, Ashish Kothari says that the demand to ban the NBA "would be laughable if it was not so full of tragic implications for freedom and democracy."

Meanwhile, leading activist Medha Patkar, writer Arundhati Roy and the NBA's lawyer Prashant Bhushan face contempt of court charges in the New Delhi Supreme Court. The three have been accused of launching a "blitzkrieg against the judiciary" by taking part in a demonstration outside the Supreme Court in December 2000. The complainants accuse Roy and Patkar of inciting the crowd to kill them.

The three accused have refused to apologize for the baseless charges and their affidavits rejecting the charges are now being investigated as further examples of contempt. Roy's affidavit states that the case "indicates a disquieting inclination on the part of the Court to silence criticism and muzzle dissent, to harass and intimidate those who disagree with it."

Attempts are also being made to muzzle international critics of the project. On July

12, Canadian citizen Ali Sauer was deported on arrival at Delhi airport, despite holding a 6-month Indian visa. Sauer was given no reason for her deportation but overheard officials referring to her support for the NBA, and saw a document referring to her as a "Threat to National Security." Sauer has travelled to the Narmada Valley but had never been arrested for her activities there.

Two other overseas activists, Nikki Warwick from Australia and Annie Leonard from the US, were recently refused Indian visas. Warwick, who visited the Narmada Valley during the 1999 monsoon-season protests, was accused of "Indulging in Anti State Activity" by the Indian Embassy in Australia.

Leonard was recently told by Indian officials in the US that she was on the "Adverse List" and was prohibited from ever visiting India. Leonard works on toxic pollution issues and has never visited the Narmada.

What you can do: Write letters of protest to Atal Behari Vajpayee, Prime Minister of India, 7, Race Course Road, New Delhi 110001. Fax: +91.11.301.6857 Email: vajpayee@sansad.nic.in

IN THIS ISSUE

- Brazil:** New dams are surfacing in the wake of a major energy crisis. [Page 6](#)
- Brazil:** Cana Brava Dam protests continue. [Page 7](#)
- Dams Lite:** Run-of-river dams are not benign. [Page 8](#)
- Honduras:** A tiny dam leads to violence against affected people. [Page 10](#)
- Ghana:** The Bui Dam would flood one-quarter of a national park and destroy habitat for rare hippos. [Page 12](#)
- In Print:** A slew of reviews of new resources. [Page 14](#)
- California:** The notorious Auburn Dam rears its ugly head again. [Page 5](#)
- Colombia:** An indigenous activist working on issues around Urra Dam has been kidnapped. [Page 1](#)
- Commentary:** Let the sunshine in. [Page 2](#)
- Malaysia:** Selangor Dam is ruining lives for no good reason. [Page 3](#)
- India:** Orissa's recent floods were worsened by a huge "flood control" dam. [Page 4](#)
- China:** A floodplain restoration project is restoring wetlands. [Page 5](#)

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Colombian Indigenous Dam Activist Kidnapped

by Monti Aguirre

On June 2, Kimy Pernia Domicó, a leader of the Embera-Katío indigenous people from Colombia, was abducted allegedly by members of the paramilitary group United Self-Defense Forces of Colombia (AUC) in the town of Tierralta, Córdoba.

Kimy, the grandson of a great Embera shaman, had been a highly visible, outspoken leader of the Embera in their efforts to defend their lands, rights and autonomy following the construction of Urrá Dam, which flooded a large expanse of their lands and deprived them of fish, their staple food.

The abduction of Kimy is just the latest violence against Embera who have publicly stood up to protect their communities from the dam and other intrusions. Another leader, Lucindo Domicó, who played an important role in negotiations with the Urrá company, disappeared in 1999 and was later found dead. An interview with paramilitary leader Carlos Castaño in a recent issue of the Colombian magazine *Semana* stated that Lucindo was killed because he “interfered with dam operation.”

Embera Katío leaders say 16 tribal members have been killed by the paramilitary and FARC guerrillas over the past three years. The most recent assassination since Kimy's abduction was that of Alirio Pedro Domico. In Kimy's words, “We are caught between two fires – they threaten us, they burn our houses and canoes, they kill our leaders, and involve us in a war that is not ours.”

A People Dammed

Close to 70,000 people were affected by the Urrá Dam, including the Embera-Katío people and peasant communities living upstream from the dam site; peasant and fishing communities of the lower Sinú River, and the Zenú indigenous peoples located downstream.

The 73-foot-high dam, which blocks the upper Sinú River, flooded 7,400 hectares of



Kimy.

tropical rainforest in Córdoba state. The 340 MW project, which cost US\$800 million (\$200 million more than initially planned) was 40% financed by the Colombian state and 60% through international institutions, including Canada's Export Development Corporation, Sweden's Nordbanken, and the Nordic Investment Bank. Skanska, a Swedish construction company, built the project in association with Colombian company Conviviles, and Russian Energomatchexport provided the turbines.

Construction of the project's access road began in 1979. According to a document by the Embera-Katío, “the road brought rapid colonization, diminishing of the fauna due to hunting and chainsaws; and everybody began to compete for lumber cutting. People began to abandon the traditional economy and values in exchange for an economy dependent on lumber cutting and money. This has been a very painful process as it has also originated internal conflicts in the community.” The project was also marred by poor consultation with affected people.

In 1995, Kimy and Lucindo Domicó organized the *Do Wambura* (Farewell to the

River) just before the river waters were diverted for dam construction. A thousand Emberas travelled on the Sinú River in their canoes to the city of Lorica.

When the Emberas took their case to the Constitutional Court, Colombia's highest judicial court decided in their favor, forcing the government and company to negotiate with them over their losses. However, before the process could be completed, the Ministry of the Environment in November 1999 granted the company a license to begin filling the reservoir.

Once again, the Embera took their case to the judicial system, while continuing other protests against the project. 170 Emberas, led by Kimy, marched 700 kilometers from their lands to Bogotá. There, they staged a four-month vigil at the Ministry of the Environment, which resulted in the re-opening of negotiations between the Embera-Katío, the government and the company. On April 19, 2000, an agreement was signed which was to have guaranteed that steps be taken to ensure the survival and well-being of the Embera.

Drug War's Victims

But throughout this process, violence was escalating in the Embera-Katío's lands. The cause appears to be a struggle for power in the region between paramilitary forces and guerrillas. The Embera's territory is rich in resources, and because of its isolation is well-suited to coca cultivation. Kimy had been an outspoken opponent of pressure from both the guerrillas and paramilitaries to grow coca in Embera territory.

Kimy visited the United States in 2000 to alert US Senators and Representatives to the unintended violent consequences for indigenous people expected from “Plan Colombia,” a US aid package for military aid to combat coca growing and drug trafficking. He gave testimony at that time about paramilitary and military collaboration, and emphatically stated that increases in military

continued on page 15

Let the Sunshine In



Things are not always as they seem in the complex world of big dams. This issue is full of stories illustrating the false premises, failed promises and ulterior motives behind large dam schemes. There are tales of a “flood-control dam” that instead exacerbates floods, of an unneeded water-supply dam in one of the wettest places on earth, and of an entire category of dams – so-called run-of-river schemes – whose often serious impacts belie the innocuous image given them by dam proponents.

Sometimes, the ulterior motives behind large dams are more compelling to its backers than the officially stated purpose of water supply, electricity production or flood management. Often, one of the driving motives is simple greed, fueled by nice profits for the engineering and construction firms building the dam, and kick-backs to the politicians greasing the way for it. This explains many dams that seem in search of a problem to solve.

Political motivations are strong contenders for Most Popular Ulterior Motive behind large dams, next to the money factor. Dams are often a political party's highest-profile way to address a seemingly intractable problem, such as poor water supply or electricity blackouts. The problem might be better addressed in other ways – as is the case with Brazil's energy crisis (see page 6) or Malaysia's water crisis (opposite page), but political reality in most countries motivates many politicians to take big, flashy actions. Nothing seems to get a politician out of hot water (or *no* water, in some cases) more visibly than by building something big and concrete.

Too often when there are strong political motivations for damming a river, there are too few politically strong groups able or willing to stand up and oppose a project. This issue of *WRR* has a sobering number of stories describing violence and repression against dam activists, revealing just how far some governments and their corporate friends will go to ensure a smooth path for big-money projects like a large dam. From the arrest of key activists, as in India's Narmada Valley (see back page) to the harassment of affected people opposing Brazil's Cana Brava Dam (p. 7) to the death of a protestor in Honduras (p. 10), stories like these are sadly common in the *WRR* archive.

Thanks to the comprehensive work of the World Commission on Dams (WCD), the world now knows much more about large dams' secretive and exclusionary planning processes, their exaggerated benefits and underreported impacts, and their poor economics. The WCD also revealed that the only way to avoid many of these problems is to open these projects up to the bright light of public participation. The WCD guidelines are clear on this: at the heart of the commission's report is a shift to recognizing the rights of all stakeholders and assessing the risks they (often involuntarily) face. As former WCD chair Kader Asmal has said, “It moves away from a practice that trades off the losses imposed on a minority in the name of benefits received by the majority.”

Unfortunately, some of the most powerful people in the world of dams are choosing to bury this report and its guidelines. Governments who hope to continue building dams “the old fashioned way” are resisting it or even outright rejecting it. The World Bank, which has been a critical proponent of large dams, has in the past set the standard for other financial institutions and governments on these controversial projects, but on the WCD guidelines it is lowering the bar. The Bank – still an important catalyst for dam-funding worldwide even though it has scaled back its direct involvement in large dams – has marginalized the WCD report, despite having sponsored the commission and been involved in the entire process. On at least one post-WCD project, Bujagali Dam in Uganda, World Bank project staff have been told they should not attempt to comply with WCD guidelines, only World Bank policies. NGOs have been pressuring the Bank to fully adopt the guidelines, but the monolithic institution is proving no more quick on its feet on this issue than it has been on innumerable other concerns raised by activists over the years.

IRN will travel to Washington, DC in September to protest the World Bank's backpedaling on the WCD during the Bank's annual general meeting. Activists are planning a “Teach-In” that is likely to attract several thousand activists from around the globe, which will look at the big dams debate as well as Third World debt, privatization, mining, water supply and other issues. The meeting will include finance ministers and central bankers from 25 countries, as well as officials from World Bank, the International Monetary Fund, and World Trade Organization – “a veritable Board of Directors of the global economy,” note the organizers of the teach-in. Join us if you can.

Lori Pottinger

For more information on the teach-in, please see <http://september30.org>

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IRN is an affiliate organization of Friends of the Earth International.

Malaysian Dam a Poor Response to Water-Management Crisis

by Sonia Randhawa

Dust swirls round the house. There hasn't been water supply to the village of Kampung Gerachi for six months. Every day, the inhabitants are forced to drive 20 minutes away simply to bathe.

In nearby Kampung Peretak, motorcycles stand half-buried in mud. The Sungai Luit River, which passes through the village, is clogged with tree-trunks, rubbish and other debris. The villagers collect rainwater for drinking now; they used to get drinking water from the river, but it is too polluted now.

All this was caused by the US\$55 million Selangor Dam, currently under construction in peninsular Malaysia, which has devastated the two indigenous communities that are being resettled for the project. Ongoing construction work has turned the village hamlets into tiny forested islands in a sea of earth-moving equipment and denuded land.

The dam is supposed to provide water to Selangor state, but the sad truth is the dam is unneeded. The region receives two meters of rainfall each year. It is one of the wettest places in the world, but because of poor water management our taps run dry while our roads are flooded.

In 1998, Selangor, Malaysia's most populous state, faced an almost unprecedented crisis of water supply. The state faced a drop in supply of 26%, and 1.8 million people had their water supply disrupted. Rainfall was low, and many residents relied on water brought in via tankers. The problem lasted for months, with relief efforts costing about \$5 million.

However, the problem was not a lack of water, but poor water management. The state had more rainfall in the first three months of 1998 than it had in previous years, yet there was a lack of raw treatable water because pollution closed several treatment plants.

The shortage was made worse by system leakages. More than a third of Selangor's piped water was lost through leaks. If the leaks were reduced to an internationally acceptable level, say 14%, it could provide water for over a million people even at the currently inflated Malaysia consumption estimates of 559 liters per person per day. The scale of this demand-management problem is still not acknowledged by the government.

The water shortage of 1998 is not the only justification for the construction of the Selangor Dam. Water demand projections

have been greatly exaggerated, with demand expected to grow at a phenomenal rate over the next ten years. For the predictions to make sense, the population of Selangor has to grow at 9% each year. This is twice the most recent growth rates and almost four times the national projected growth rate.

Already there is a gap between actual and projected water consumption figures. The dam is based on the assumption that Selangor will be consuming at least 3,000 million liters per day (MLD) by the start of 2001. During the first three months of 2001, consumption was less than 2,700 MLD. Even using the Selangor government's inflated demand figures, that is enough extra water for 600,000 people.

But there are people who will benefit from the dam, and so the project moves forward.

A lot of these benefits come from the short-term employment opportunities offered at the dam site. There are three thousand workers at the site, public relations representatives in the nearby town Kuala Kubu Bharu and a host of consultants based in Kuala Lumpur. The Environmental Impact Assessment, the surveys and studies all create work.

Each person involved, each company hired has a direct stake in building a dam. And, unlike those who suffer from the construction, those who benefit wield a lot of power. It boils down to big business against 300 indigenous people and the environment.

Meanwhile, the village of Kampung Gerachi is preparing to move. Developers have constructed a "new" Kampung Gerachi on the top of a steep hill, inaccessible and far from a river, vital to the social life of the community. The houses are cramped, and construction is poor – timber beams are splitting, ceiling panels peeling and cracks are appearing in the walls. Mini-landslides have occurred on the cleared site, which buried the front steps of some of the houses.

The Orang Asli, as the indigenous people are known, were promised one acre of land

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*Photo can maybe be bigger,
but depends on cropping too.
I made a little bigger, but will
leave for Keith to fix.*

These Orang Asli women will be evicted for Selangor Dam.

Photo: IRN

around each house on which they would be able to grow durian and petai, cash crops critical to the community's survival. However, the new houses do not have even a quarter of an acre. The topsoil has been stripped from the surrounding area so the villagers will be unable to grow anything in their garden plots. Grass that was planted has already died.

As compensation, the Orang Asli have been promised oil palm holdings. The government has cleared large tracts of forest surrounding the resettlement sites to plant oil palm trees. Accustomed to living off of the forest, the Orang Asli will be expected to harvest oil palm and become wage laborers. The government is currently paying subsidies to small oil palm plantation owners. Until the oil palm trees mature, each household can expect to be paid about \$65 a month. This is about a third of what many consider minimum wage.

This disruption, suffering and poverty is unnecessary. The state of Selangor has enough water, what it lacks is proper water management. The beneficiaries of the project are the wealthy, those who lose out make up the poorest strata of Malaysian society. The project should be stopped and the affected Orang Asli communities given proper compensation for the destruction of their ancestral lands. ■

The author is with SOS Selangor, a Malaysian group working to fight the Selangor Dam.

Hundreds Flooded by India's Hirakud Dam

Politics, Not Nature Made Orissa Floods Calamitous

by Rohan D'Souza

When laying the foundation stone for the Hirakud Dam in eastern India in 1946, then British Governor Sir

Hawthorne Lewis proclaimed that with the dam, "flood, drought and famine will be banished" in Orissa province. Hirakud was one of the first multipurpose dam schemes in India, with flood control as its primary objective. When it was being built it was touted as a "permanent solution" for preventing floods in the lower Mahanadi River.

Almost five decades down the line, the official rhetoric of controlling the Mahanadi has been replaced with a concern for saving the dam itself. In July, hundreds of villages in the Mahanadi Delta were flooded by a surge of water caused when authorities opened 51 of the dam's 64 gates in July. Engineers feared that the rapidly rising reservoir could overtop the dam, causing an even greater disaster. In the words of Orissa's chief secretary, D. P. Bagchi, "the dam's safety was of prime importance." The Hirakud Dam is holding back flood waters as designed, but only to release them in lethal torrents.

To explain this irony as a story of excessive rain would wrongly perpetuate the myth that flood control through embankments and reservoirs is a viable and unavoidable response to bank-bursting rivers. The Orissa Delta, much like other deltas in eastern India, has, over the past 150 years, been transformed from a flood-dependent ecology to a flood-vulnerable landscape. This has occurred through a range of technological interventions driven chiefly by political considerations.

River systems function not only as arteries for draining precipitation but are also significant agents for erosion of soil, its transportation and deposition. This latter task is particularly important for building up deltas and recovering land from the sea. Floodplain rivers are also parts of larger chemical and geomorphological processes. The timing and quality of natural floods are vital to regulating a range of biological processes in wetlands.

Unfortunately, time and again floods on the Mahanadi have been treated as mere symptoms of meteorological excess. This narrow urban-centric view has been constructed and perpetuated by interests that have willfully marginalized a spectrum of flood utilization practices that were used for centuries in eastern India. In the 1930s, the

celebrated engineer William Willcocks delivered a series of lectures in which he described a complex flood irrigation system in eastern India. This system comprised a network of channels running along the natural drainage lines of the region and designed to tap the muddy crest waters of the rivers during periods of flood. The channels were designed to nourish fields with silt, which then required no artificial manures. Other flood coping practices used by peasants in eastern India included evolving rice varieties that could grow in deep water, strategically locating housing, and keeping drains in working order.

These practices, however, have been eliminated by flood control enthusiasts who have pursued policies for insulating lands from floods through embankment construction and other flood control technologies. This has been followed by the proliferation of urban and rural settlements in floodplains, the systematic drainage of flood-absorbing wetlands and the obstruction of natural drainage by the careless location of roads and railway lines. This mindless "development" of the floodplains has now induced unnatural flooding in which most of the damage is being caused by enhanced currents and water-logging. The destruction wrought in the Kosi region of Bihar and in eastern Uttar Pradesh by embankments is clear testimony to the dangers of interfering with natural drainage by constructing obstacles in the flood basin.

In Orissa, a prescient flood committee of 1928 noted that floods were inevitable in a deltaic country and it was "useless" to attempt to thwart the "workings of nature" through flood control measures. This committee argued that in Orissa the problem was not how to prevent floods but how to pass them as quickly as possible to the sea and therefore the solution lay in "removing all obstacles" from the path of the flood. The report of the 1928 committee, however, was buried by the politics of the period which instead facilitated the construction of the Hirakud Dam.

More recently, the World Bank studied 25 large dams in India and singled out two that were particularly unable to cope with high flood flows, one of which was Hirakud. The investigators wrote of these two dams that "the consequences of dam failure during a major flood would have to be described with some adjective beyond disastrous."

Orissa's decision-makers continue to ignore the need for a new direction in dealing with flooding. And its population continues to pay the price by being trapped between the hammer of flood control technologies and the anvil of flood relief politics. The July floods may be one of the worst floods that Orissa has witnessed, but if current flood policies continue it will surely not be the state's last flood catastrophe. ■

This is an edited version of an article first published in The Telegraph (Kolkata) on July 25, 2001.

Dams and Flooding: New WWF Report

A new report by Worldwide Fund for Nature (WWF) warns that dams built with the promise of reducing flooding often exacerbate the problem with catastrophic consequences. The paper, "Dams and Floods," shows that dams are often designed with a very poor knowledge of the potential for extreme flood events. Where data does exist it may fail to consider current risks such as increased rainfall due to climate change or increased run-off due to deforestation or the drainage of wetlands. The loss of these natural sponges for floodwaters within the river basin increases the risk of extreme floods. WWF argues that many of these problems could be avoided if the recommendations of the World Commission on Dams were applied to future dam projects.

According to the paper, lack of adequate information means that dams are often built without adequate spillways to cope with extreme floods. Dam managers often wait too long to make emergency releases of water during exceptionally heavy river flows. "The primary purpose of their dams is to capture water in order to generate hydroelectricity and/or provide water. To release the water into the river is to 'waste' it." However, as the reservoir overfills they are forced to make releases of water that are far greater and more sudden than flows during the natural river flooding.

The full report is available at www.panda.org/livingwaters

Going with the Flow on the Yangtze

Wetlands Restoration Project Will Reduce Floods, Restore Habitat

by Doris Shen

Awetlands project in the lower Yangtze is working to restore lakes and wetlands with the aim of absorbing floodwaters. The project is expected to be more effective than the upstream Three Gorges Dam at dealing with the river's often deadly floods.

Managed by the Beijing office of the World Wide Fund for Nature (WWF) and local governments, the project is restoring agricultural land back to its original state of wetlands and lakes. The reclaimed areas will again serve as sponges of seasonal floodwaters. In the first year of the restoration project, WWF reports that more than 30 species of birds have already returned to the area.

The restoration initiative plans to resettle and rehabilitate half a million people and restore 20,000 square kilometres of wetlands in central China. WWF predicts that the program should reduce the frequency and severity of flooding, regenerate the ecosystem and give a boost to Asia's most important wintering spot for migratory birds, such as the Siberian white crane and the white stork.

Over the next five years Dongting and Poyang lakes will be returned to their 1950 size, their surface area increasing by a combined 3,000 square kilometres. According to a July 19 report in the *Far Eastern Economic Review*, many of the farmers on the reclaimed land are so frustrated with annual flooding that they have required little persuasion to move to higher lands.

The US\$610,000 restoration program consists of six pilot projects in Hunan, Hubei and Jiangxi provinces, and will include programs to develop alternative livelihoods for farmers, who will need to switch from rice cultivation to other agricultural products. One alternative is fishing which thrived in



Rare and endangered birds, such as this Siberian Crane, are returning to the restored wetlands.

the Yangtze wetlands up to the 1950s. Pig and duck farming and seasonal market gardening are also being implemented.

Flooding on the Yangtze has devastated surrounding agriculture and industry in recent decades. The central government's traditional response – to build ever-higher dikes to protect increasing settlement in the river's floodplain – has failed to hold back the tide. Dike failures along with increased land reclamation in the floodplains have worsened China's flood damage.

Before the 1950s, floodwaters were absorbed by hundreds of small lakes north of the river in the Jiangnan plain, the larger Dongting and Poyang lakes to the south, and thousands of hectares of wetlands around the lakes. Flooding has been exacerbated by recent large-scale logging in the upper reaches of the Yangtze in western China, creating increased storm water runoff which effects densely populated central and eastern China.

Land reclamation was dramatically accelerated after the Communist Party gained power in 1949. People were ordered to "plant wheat as far as the eye can see." Workers soon filled in Yangtze wetlands and blocked their connection to the river. The reclaimed land was planted with high-yield grain and cotton, and farmers were resettled there from poorer regions. This policy had devastating consequences, with flood damages growing every year.

Correcting Mistakes

The restoration of lower Yangtze lakes and wetlands follows an important government flood management order. Immediately after the devastating Yangtze floods of the summer of 1998 which killed more than 3,000 people, Premier Zhu Rongji issued an eight-point Yangtze flood management plan that signified a major shift in flood management policy. The order included a ban on all logging in the uplands of Sichuan and Tibet, afforestation programs for upstream areas, the restoration of downstream lakes and wetlands, and moving people out of floodplains and restoring their livelihoods.

Three Gorges Dam proponents have been quick to qualify every flood season to justify the massive structure, which is too far upstream to actually handle most of the watershed's floods. During the 1998 flood season, Lu Youmei, chairman of Three Gorges Dam Corporation declared, "If the Three Gorges Project had already been completed, the problems of flood control would have already been solved."

In contrast, Premier Zhu Rongji's Yangtze flood policy response did not include Three Gorges Dam as a flood control tool. ■

State and Federal Lawmakers Nix Auburn Dam Proposal

by Charlie Casey

A state senate committee recently dismissed a proposal for a multi-billion dollar bond measure that would have asked voter approval for financing construction of a dam on the American River in Northern California.

Dam supporters tried to use the state's energy crisis as a reason for building the seriously flawed 685-foot-high project. But Friends of the River campaigned vigorously

against the project, arguing that the project could produce as little 60 megawatts of reliable power, according to a 1992 report by Sacramento Municipal Utility District. In past lives, the dam has been touted as a flood-control project for the capital city of Sacramento, but because cheaper and more reasonable options are available, the dam is again being described as a "multipurpose dam," which will produce power, flood pro-

tection and water. But with the dam's hefty multi-billion-dollar price tag, safety concerns (it is proposed in an active fault zone) and serious environmental impacts, the bond measure garnered little support.

Although the committee that tabled the bond – the state senate's agriculture and water committee – can usually be counted on to support major water projects, it may

continued on page 15

New Crisis, Old Tune: Brazil's Energy Woes Accelerate Plans for New Dams

by Glenn Switkes

In May, Brazilian President Fernando Henrique Cardoso said he awoke to learn that his country was facing a grave energy crisis. Perhaps President Cardoso's advisors were reluctant to tell him what energy analysts had been warning for months – that the privatization of Brazil's power sector coupled with the country's overwhelming dependence on hydropower for its electrical energy had made Brazil especially vulnerable following two years of below-average rainfall.

At the beginning of the six-month dry season, reservoirs in the industrial southeastern region had already fallen to below 30% of their capacity. Projections showed that water levels could fall below the 10% level considered critical for driving the turbines in

some of the world's largest hydroelectric dams. Brazil is more than 90% dependent on hydropower for its electrical energy.

The Cardoso government responded by decreeing mandatory energy rationing, aimed at cutting electricity use by 20%. Residential customers, who use 25% of the country's electricity, were given "electricity quotas" which, if violated, would result in punitive shutdowns of their electricity service for 3 days (6 days for repeat offenders).

Industrial users, who consume 40% of the nation's energy, were given more options with less-draconian consequences, including voluntary shutdown of parts of their facilities or identification of alternative electricity sources – including the option to construct new dams or gas-fired power plants. The

results were impressive: São Paulo registered an immediate energy savings of 22% following the government's conservation measures.

Most analysts agree that the privatization of the Brazilian energy sector has resulted in at least a temporary slowdown in investments in new power plants. Célio Bermann, of the Electrical Energy Institute of the University of São Paulo (IEE/USP), says, "Privatization of the public electrical utilities has failed to meet its objectives." The fragmentation of state energy companies into generating, transmission, and distribution companies has created distortions in the pricing structure, and eliminated incentives for energy efficiency and demand-side management. According to Bermann, "With energy generation and distribution no longer controlled by the same company, expenditures on conservation are harder to calculate." The government's National Electrical Energy Agency (ANEEL) requires the privatized companies to invest a minimum of 1% of their receipts on energy efficiency, but this has proven nearly impossible to monitor.

Investors quickly bought up 70% of Brazil's energy distribution companies, whose sale was heavily subsidized with low-income loans from Brazil's National Development Bank (BNDES) and through investments by public pension funds, but they were slower to bid for hydroelectric dams such as Porto Primavera which are burdened by billions of dollars of debt, or to risk investing hundreds of millions of dollars on new dams.

Transnational companies which had initially declared their intentions to build new gas-fired generating stations using natural gas piped from Bolivia also got cold feet, forcing the government to evaluate various mechanisms to shield these companies from devaluations of the Brazilian currency, the real, against the dollar. Of 49 planned gas-fired power plants, only four will emerge from the drawing board by year's end, according to the government's rosier predictions.

Kill the Messenger

As in California, the Brazilian government's response to the crisis was to blame environmentalists for delaying the licensing of new generating stations. But NGOs' suggestions for options other than large dams and more

continued on page 11

Energy Alternatives: The MAB Proposal

With the Brazilian government's strategy for combating the country's energy crisis emphasizing construction of new large dams and natural gas power plants, Brazil's Movement of Dam-Affected People (MAB) has developed, with the Electrical Energy Institute of the University of São Paulo, its own recommendations on steps Brazil could take immediately to alleviate the crisis. They include:

1. Reduce losses in the Brazilian electrical system. Currently, 16.5% of all electrical energy generated is lost before reaching end-users. This compares unfavorably with the international "standard" of about 6%. MAB recommends that the government provide incentives for companies to better insulate transmission lines, replace outdated or defective equipment, and take other measures to reduce losses.

Potential gain in energy supply: 6,500 megawatts

2. Modernize dams which are more than 20 years old. Investments should be made immediately to modernize components and systems.

Potential gain: 7,600 MW

3. Construct small hydroelectric dams. Decentralized energy could be supplied to communities throughout Brazil by exploiting the country's potential for small hydro dams. MAB warns that multiple dams on rivers should be carefully assessed for cumulative impacts.

Potential gain: 9,795 MW

4. Cogeneration using biomass. The southeastern region of the country has a great potential for using sugar cane wastes or other plant residues for energy generation.

Potential gain: 3,650 MW

The availability of more than 27,000 MW represents a "bonus" equivalent to about 40% of Brazil's current installed generation capacity, at far lower economic, environmental, and social cost than damming the nation's rivers (some two-thirds of Brazil's new hydroelectric potential is in the Amazon). This figure does not include the enormous potential of wind energy (24,900 MW in coastal Ceará state alone), installation of solar hot water heating systems and photovoltaics, or the benefits of energy conservation, which must figure into any future national energy plan.

IDB-Financed Cana Brava Dam Causes Controversy in Brazil

by Selma Barros

Cana Brava Dam, a hydroelectric project being constructed on Brazil's Tocantins River and financed by the Inter-American Development Bank (IDB), has brought a Belgian company into conflict with Brazil's Dam-Affected Peoples' Movement (MAB).

On June 19, approximately 1,000 dam-affected people mobilized in Minaçu (Goiás state) to denounce what they term intransigence on the part of the company building the project, which refuses to negotiate resettlement and compensation terms in an open and transparent manner with those who will lose their homes, businesses and jobs as a result of the dam. Because the demonstrators were surrounded by 200 policemen, representatives of unions, the Pastoral Land Commission, legislative advisors, and the Bishop of Goiânia, Dom Guilherme, were called to the site to try to diffuse tension and to support the demonstrators.

This is the third time the affected families have held mobilizations at the dam site to protest the project and send a message to the company responsible for the project. The dam is expected to add 450 MW of installed capacity to the North-South transmission corridor, with most of its energy being used by the industrial complexes of the southern regions of Brazil.

Resettlement Underestimated

MAB says that more than 1,000 families will be affected by Cana Brava, four times more people than estimates in the company's Environmental Impact Study. Affected people complain of ridiculously low compensation being offered to them and the lack of information regarding the criteria for determining the value of their land and improvements. The company has offered resettlement on lands of poor quality, which will not permit the relocated families to survive. The project, now under construction, continues full speed ahead, but the company building the dam, CEM/Gerasul (a subsidiary of the Belgian firm Tractebel) has now pushed its completion date ahead by 18 months.

The company refuses to provide compensation to those who traditionally work in the region as artisanal miners (*garimpeiros*), and some have complained that they were forced



Santina Ferreira, a "quilomba" affected by Cana Brava, is unhappy with compensation offered.

Photo: Selma Barros

to halt their activities in the area affected by the dam, under threat of being arrested and their equipment seized.

CEM/Gerasul has also refused to negotiate compensation terms collectively and says it will not recognize MAB as a spokesperson for the dam-affected. CEM/Gerasul officials have called MAB representatives "outsiders" without legitimacy in the region. Families have charged intimidation on the part of the company, which has brought military police along with them for "security purposes" when negotiating compensation terms.

According to MAB, the company's refusal to recognize the right of families to organize as part of the movement is due to the group's victories elsewhere in Brazil. In the resettlement for Itá Dam, a project which was also constructed by CEM/Gerasul and involved MAB in the negotiations, dam-affected families received compensation and resettlement lands which took into account the size of their families and the quality of their original lands.

During the June demonstration on Cana Brava, several busloads of supporters affected by Itá Dam arrived from the southern region of Brazil, after three days and three nights

on the road. A small businessman from the Itá area distributed copies of an analysis by the area's chamber of commerce that documented the losses suffered by local industries and businesses, and by family farmers who received no compensation from CEM/Gerasul.

The arrival of demonstrators from Itá made the company furious. Company president Vitor Paranhos threatened to walk out of the meeting "if anyone from MAB opens their mouth." In response to the company's challenge to MAB's legitimacy, families affected by Cana Brava arrived by foot, boat, and horse to Minaçu in order to sign a petition designating MAB as their representative.

Besides helping to organize demonstrations, MAB and a network of social and environmental NGOs have written three letters to the IDB criticizing the Cana Brava project. In March 2000, IRN had urged the IDB not to finance the project until Tractebel responded to the concerns of local populations. This request was ignored by the IDB's board, which approved \$160 million in loans to Tractebel's subsidiary CEM/Gerasul for the dam.

On June 21 MAB and the Brazilian NGO Network on Multilateral Financial Institutions (Rede Brasil) and the Rios Vivos Coalition handed IDB president Enrique Iglesias, who was visiting Brazil, a letter denouncing the failure of officials in the IDB's Private Sector department (PRI) to address the complaints of populations suffering impacts from Cana Brava. Despite this fact IDB president Iglesias has said that "the private sector, through new generating projects, will play a fundamental role in the solution of Brazil's energy crisis." The PRI's check book for financing private sector infrastructure projects in Latin America has now been doubled, and may reach 10% of the IDB's total loan portfolio in coming years. ■

Dams Lite?

Run-of-River Projects No Panacea

by Ryan Hoover

Are huge reservoirs a thing of the past? Today, a significant number of the world's proposed dams are being billed as "run of river," which feature smaller reservoirs and, presumably, smaller impacts. Can we believe the industry hype that run-of-river schemes leave rivers in a relatively natural state, or are such projects just "engineering gimmicks" as former WCD commissioner Ted Scudder has called them?

Run-of-river dams are marketed a bit like low-tar cigarettes or "lite" beer. They promise electricity, but with far fewer messy side effects. Even the term "run-of-river" evokes images of free-flowing cascades of water rushing unhindered to the sea. It seems to imply that the river is in charge, unaltered and uncontrolled. In fact, dam proponents often use the terms "run-of-river" and "minimal social and environmental impacts" interchangeably when promot-

ing a project. Run-of-river projects can, however, have large dam walls, significant social and environmental impacts, and big price tags. In fact, although generally run-of-river means a smaller reservoir and more natural flows, the term is not clearly defined.

Most large dams are storage dams, meaning they store water during the wet season and release it during the dry season, or hold water when electricity demand is low and release it when it is high. Run-of-river projects, on the other hand, are theoretically designed to ensure that the amount of water flowing into them always equals the amount of water flowing out of them (even though many of them store water for hours, days, or even weeks at a time).

Proponents of run-of-river projects frequently claim they do not require a reservoir. In reality, all run-of-river dams impound water, either to create "head" for hydroelectricity generation, to raise water levels to the height of diversion intakes on water projects or to create enough depth for navigation. According to IRN's Patrick McCully, "In theory, no dam with gates should be considered run-of-river because closing and opening gates implies storing and releasing water. In practice, dams with some limited – but undefined – storage capacity are referred to as run-of-river. It's a sort of Alice in Wonderland, 'it means exactly what I want it to mean' term." Thus, the 113-meter-high Pangué Dam in Chile which displaced 1,300 indigenous people qualifies as run-of-river, as does the 62-meter Bonneville Dam in Oregon, or the 1.45-kilometer-wide Cana Brava Dam in Brazil.

A key selling point of run-of-river dams is the claim that their "head ponds" are small in comparison to storage reservoirs. Large reservoirs result in physical and economic displacement, which adds considerably to project costs and often incites public opposition. Such opposition can result in costly delays and even project cancellations – all major concerns of the risk-averse private investors and guarantee agencies who are playing a growing role in the damming of the world's rivers. Head ponds, on the other hand, are portrayed as small and innocuous – they're just ponds, the term seems to imply.

Recent dams described as run-of-river, however, blur the distinction between head

continued opposite

A Run-of-River Sampler

The following are existing or proposed run-of-river projects whose impacts may outweigh their benefits.

■ Maheshwar Dam, India (Height: 35 meters)

This dam would displace 35,000 people and destroy the livelihoods of communities upstream. Rates of compensation are undervalued, and critics estimate that if compensation were tied to full replacement value it would render the project economically unviable.

■ Xeset Dam, Laos (10 meters)

This dam generates less than two thirds of its installed capacity and produces virtually no electricity during extended periods of the dry season. Driving output down further is the government's commitment to maintain downstream fisheries by releasing water during the dry season rather than diverting it.

■ Theun Hinboun Dam, Laos (25 meters)

In addition to the impacts on fisheries described in the article, this dam is generating far less electricity than promised.

■ Mepanda Uncua Dam, Mozambique (Height unknown)

This \$1.2 billion proposed dam on the Zambezi River would displace approximately 2,000 pastoralist people from its 100 sq. km. reservoir in order to power a huge aluminum smelter hundreds of kilometers to the south. The dam would also further regulate the flow of the Zambezi where existing dams have already caused significant damage to fisheries and the river's delta.

■ Popa Falls Dam, Namibia (8 meters)

This recently revived 30MW scheme is located on the Okavango River, the source of the delicate Okavango Delta. During part of the year, it will leave the popular tourist destination at Popa Falls virtually without water. The 2.9 sq. km. head pond will require the relocation of some 90 residences and increase evaporation by 1.5 million cubic meters annually, an impact that has unknown consequences for the fragile Okavango Delta ecosystem.

■ Cana Brava Dam, Brazil (66 meters)

This 1,450-meter long dam on the Tocantins River will, if completed, displace more than 1,000 families. Recent demonstrations concerning resettlement and compensation terms sparked confrontations with hundreds of police officers (see p. 9).

■ Chalillo Dam, Belize (30 meters)

The head pond behind this dam will inundate 1,000 hectares of riverine habitat, which is, according to some scientists, the only habitat of its type in all of Central America. The dam would further threaten the endangered Scarlet Macaw and other rare species.

■ Bonneville Dam, USA (62 meters)

Constructed on the Columbia River in 1935, Bonneville seriously affected thriving salmon populations and other wildlife in the Columbia Basin. The dam also inundated a number of cultural sites important to Native Americans.

Pak Mun: The river “runs” again

Photos: Assembly of the Poor



A youth activist celebrated the opening of the sluice gates of the Pak Mun Dam in June. People have been living at the protest village at the dam site since March 1999 to pressure the government to decommission the dam. Finally, in June, the Thai government agreed to open the dam's gates for a four month trial period.



This young boy shows off a Mekong catfish caught after the gates at Pak Mun Dam were opened. About 40 to 50 species of fish have reportedly returned for the first time since the dam started operation. Villagers organized a ceremony to celebrate the return of the fish and the revival of a local fish market.

pond and reservoir. The “head pond” behind Maheshwar Dam in India's Narmada Valley would force some 35,000 people from their homes. In Mozambique, the proposed Mepanda-Uncua Dam's head pond would cover more than 100 square kilometers.

In 1994, the Mekong River Secretariat proposed the construction of a cascade of nine “run-of-river” hydropower projects along the Mekong's mainstem that would have inundated 1,000 square kilometers and displaced more than 60,000 people. Although the scheme would have turned the Mekong into a staircase of reservoirs, the project's documents never once used the words “dam” or “reservoir.”

Though run-of-river projects are smaller than most storage projects, they can still have major impacts. As Indian activist Shripad Dharmadhikary points out, “While there is some correlation between the size and the impact of a project, this is by no means a fixed equation.” For example, the proposed US\$530 million Bujagali Dam on the Nile River in Uganda is being promoted as run-of-river and would have only a 4.2 sq.km. head pond, but it will deprive thousands of local people of their livelihoods, possibly drive some rare fish species to extinction, destroy a culturally important waterfall and wipe out a \$4 million per year rafting industry. And the impacts of the tiny 3MW Babilonia HEP run-of-river dam in Honduras seem well out of proportion to its size (see page 10). More than 100 families will lose their coffee plantations to the head pond, a 1,500-foot waterfall will be destroyed, and communities living down-

stream will no longer be able to utilize the river through gravity-fed water systems.

Underpowered, Over-Hyped

One of the most fundamental problems with run-of-river projects is that they promise more electricity than they can actually deliver. The final report of the World Commission on Dams states, “Power benefits of run-of-river hydropower plants may be much lower than could be expected from their installed capacity.” Because the electricity output of run-of-river projects is dependent on the amount of water flowing in the river at any given time, their power output may be insufficient and unpredictable, which may render them economically infeasible. During the rainy season, or when a river is in flood, run-of-river dams frequently cannot use all the water that flows through them to produce electricity. During the dry season, the runoff in the basin is often far too low to produce electricity at full capacity.

The Pak Mun Dam in Thailand exhibits both of these problems. It produces only 40MW of its 136MW capacity during the high demand period in April-May. In very wet years, it faces another obstacle to power generation. During some years, the Mekong River floods so severely that the river comes up to the toe of the dam. The elevated water levels at the dam's base mean that there is not enough head pressure, lowering power generation, and even occasionally forcing the power plant to be closed.

Because run-of-river dams' electricity production is based on the river's flow rather than a reservoir's releases, construction of a

stand-alone run-of-river dam may set off a spate of dam building upstream in order to maximize the efficiency of the run-of-river project. This occurred in Chile, where construction of the giant Ralco storage dam on the Biobío River was justified on the grounds that the run-of-river Pangué Dam downstream would consequently produce more electricity. Although Pangué was designed with Ralco in mind, project proponents did not publicly present the dams as a pair, thus smoothing the way for an easier approval process at the World Bank.

Environmental Impacts

Run-of-river dams' impact on the environment may not be as great as that of storage dams, but they do indeed have environmental consequences, sometimes serious ones. The havoc wreaked on delicate gorge ecosystems by the Lower Kihansi Hydropower Project in Tanzania is a prime example of how a run-of-river project can result in a loss in species diversity. Because the project diverted water from the 800-meter Kihansi waterfall, the endemic Kihansi Spray Toad, which survives on mist from the falls, has been brought to the verge of extinction. The river's wetlands are drying up, threatening rare plants. The US\$275 million project also directly affected about 22,000 villagers.

Plant diversity is typically reduced along run-of-river head ponds, albeit less than along the banks of storage reservoirs. Researchers in Sweden noted that river reaches upstream of run-of-river projects

continued on page 15

Bloodshed in Babilonia

Honduran Dam Project Shows Small Is Not Always Beautiful

by Daniel A. Graham

A small dam in Honduras has racked up major human rights violations, setting off a surprising wave of violence against local people opposed to the project. At press time, one person is dead and others have been attacked with guns and knives. All had publicly spoken out against the project.

Residents of the municipality of Gualaco in eastern Honduras have taken to the capital city of Tegucigalpa to protest the violence committed at the behest of Honduran-owned dam-building company Energisa. More than 200 people from Gualaco marched on the capitol building on July 4 to call public attention to Energisa's lack of public consultation and other irregularities in its handling of the project.

In the weeks since the July 4 march, both the central government and Energisa employees have met the protesters' demands with a series of abuses, including a recent attempt on the lives of Gualaco mayor Rafael de Jesús Ulloa (who has publicly asserted that the company moved ahead with the project without acquiring the necessary municipal approval), parish priest Fredy Cornelio Benítez Alvarez, and Sister Carmelita Luis David Pérez (both of whom have become outspoken critics of the project).

Energisa, which has already begun construction of its small hydroelectric project on the Río Babilonia, has billed its Babilonia Hydroelectric Project (BHP) as a socially responsible, environmentally friendly, and locally owned enterprise that will help Honduras meet its energy needs. But critics claim the project represents repression, not progress. Protestors have taken to calling it "our other Mitch," in reference to the devastating hurricane of 1998.

Energisa originally envisioned a 30-meter-wide dam that would produce 4.4 megawatts of power, but it recently stated that it has scaled back the project in response to public concerns and will now be building a smaller, run-of-river project that will produce just 3 megawatts. But the project will still have serious impacts, which the company appears to be unwilling to address with local opponents.

The project has well-placed allies. The Central American Bank for Economic Integration (CABEI), the principal financier for the project, sees the dam as integral to its



Photo: Daniel Graham

A peaceful demonstration by communities affected by the Babilonia hydropower project...

goal of attracting investors to Central America. Honduran Congressman Jack Arévalo, an outspoken defender of Energisa, praises the dam project as just the sort of development Honduras needs, and accuses opponents of backwardness and political gamesmanship. The US State Department has referred to the anti-dam activists' efforts as a "smear campaign" against Energisa.

Citizens of Gualaco, however, insist the Babilonia Hydroelectric Project is not as environmentally and socially responsible as its backers assert. They note that the project is located squarely within the buffer zone of Sierra de Agalta National Park. They also point to serious flaws in the project's Environmental Impact Statement, including a severe underestimation of the park's biodiversity and a failure to account for the project's downstream effects. The construction of the proposed dam would inundate 128 families' largely organic, small-scale coffee plantations, protected by Honduran law over all other land uses. Many locals have become so afraid to approach the construction zone with its heavily-armed guards that they had to let this year's coffee harvest rot on the branches. The project design will also destroy a spectacular 1,500-foot series of waterfalls and eliminate the possibility of gravity-fed water systems for nine downstream communities.

In addition to the project's many impacts, local people bridle at the aggression and arrogance of Energisa representatives and by the national police they appear to have hired to stifle opposition. In January, police jailed several dam protesters for preventing passage by Energisa vehicles to their compound, in spite of the fact that the blocked road was a private one built by community members. In March, Gualaco parish priest Fredy Benítez was stabbed, apparently in reprisal for his participation in a community forum that has been highly critical of Energisa's activities. False criminal charges have been leveled against various BHP opponents in what community members assert amounts to a hit list.

The repression turned deadly on June 30, when six armed security guards employed by Energisa shot and killed Carlos Roberto Flores, a 29-year-old BHP opponent who others assert was on Energisa's "hit list," while he was at home preparing to bathe. Police scarcely investigated Flores's death, and their official report intimates that Flores' death may have been the result of a two-way shootout. Physical evidence gathered by this reporter suggests otherwise.

Esteban Solís, lay minister of the Catholic Church in the hamlet where Flores was killed, said on the day of Flores's murder, "Over and

continued opposite

over, we tried to dialogue with Energisa, to lay our cards on the table, but nothing.”

One month after Flores's murder and nearly four weeks after marching on the cap-

(Civil Committee of Popular and Indigenous Organizations of Honduras).

However, government representatives from all sides have been far from sympa-

organizations in Tegucigalpa, but dam opponents say they will refuse to return to Gualaco until Energisa is dismantled and the BHP scrapped.

Some have questioned why peaceful opposition to such a small project is resulting in such severe repression. There are more unanswered questions than hard facts on this aspect of the project. But one answer might lie in the terms arranged by the Honduran government with the project developers. Reportedly, the Honduran Congress made a deal that if it revokes Energisa's license, the government will have to pay Energisa \$26 million, about five times the value of the project.

Meanwhile, on July 23, Mayor Ulloa, Father Fredy, and Sister Carmelita were shot at from a moving vehicle. El Ocotal community leader Isidro Zúniga said, “This is not a game. We cannot return to our homes until Energisa has been made to leave, or it may mean all our lives.”

Back at the Río Babilonia, Isidro was asked what motivated him to so fiercely oppose the Babilonia Hydroelectric Project. He looked thoughtful, then said, “I don't own any of the land they're going to inundate. When the police came that day to arrest us at the bridge, I ran straight here to the river, and I sat down on that rock over there.” Gazing for a long moment at the exuberant tropical vegetation around him, at the flock of parrots flying overhead, and the babbling waterfall nearby, he finally continued: “I sat on that rock for four hours, thinking about this river disappearing. Thinking about all these communities that will be left without water.” Then his voice failed him, and he turned away. ■



Photo: Daniel Graham

...turned ugly when police got violent.

ital, anti-dam opponents from Gualaco doggedly persist, but have received a cold shoulder both from the government and Energisa, even as they enjoy increasing solidarity and support from human rights activists. The local protestors have recently been joined by human rights activists from the umbrella organization CONACIM (National Coordinator Against Impunity) and indigenous rights organization COPINH

thetic to the groups' call for government intervention. On July 18, approximately 50 national police troops forcibly removed the protestors and their sympathizers from the capital plaza. When the protestors tried to retake the plaza that afternoon, more than 100 riot troops attacked them with tear gas, rubber bullets, clubs and a water cannon. Protestors then retreated to the headquarters of sympathetic unions and human rights

Brazil Energy Crisis continued from page 6 thermal plants have basically been ignored by the government (see box page 6).

President Cardoso also issued a controversial decree in June to help fast-track the licensing of new plants. Hydroelectric dams must now receive an environmental license within six months of the date when environmental impact studies (EIAs) are delivered to authorities. The decision-making period on new thermal plants is only four months. Given the difficulties in accessing EIAs and other technical project documents in both short-staffed government agencies and by civil society and NGOs, coupled with legal requirements for public hearings during the licensing process, these deadlines may be nearly impossible to meet. EIAs prepared by consultants chosen by project constructors are often incomplete or contain factual

errors, and environmental agencies usually request revisions of these studies before permitting projects to move ahead. The new procedure would not appear to allow sufficient time for this work.

Same Old Song

Of greatest concern to environmentalists is the fact that the government's “new” strategy for solving the energy crisis is simply more of the same. Instead of diversifying the country's energy supply and providing incentives for renewable energy sources such as solar, wind, small hydro and biomass, combined with more serious conservation and energy efficiency measures, the overwhelming focus continues to be on building large dams and natural gas power plants. While the government now plans to once

again construct some large dams under the umbrella of still-existing state companies like Eletronorte and Furnas, most of the gas plants planned are expected to be built by international actors like Enron, El Paso, Duke Power, AES, Iberdrola, and Endesa, along with state oil company Petrobras.

Brazil's energy crisis will also have a significant impact on its neighbors, with a flurry of plans being promoted for doubling the capacity of the Bolivia-Brazil gas pipeline, construction of huge natural gas plants in Argentina, Bolivia, and Paraguay, just across the Brazilian border where Brazil's more demanding environmental laws will not apply, and the completion of the Yacretá Dam project and resuscitation of plans for the Corpus Christi complex on the Paraná river between Argentina and Paraguay. ■

Bui Dam Threatens Hippos and Humans

by Julie Titone

Even where it is pinched between high hills near the village of Bui, the tree-lined Black Volta River in Ghana is impressively wide.

Simon Beseh paddles his mahogany canoe there, where the current flows east after a long southerly slide.

The 15-year-old fisherman hopes to catch enough fish so he can afford to attend high school. But he may soon be seeking another source of money for books and uniforms. His family may be forced to move from their riverside hamlet if Bui Dam is built.

Asked if the dam is a good idea, Beseh shakes his head fiercely: No.

Far to the southeast, in the seaside capital of Accra, Charles Mensa, head of the Ghanaian think-tank the Institute of Economic Affairs, is just as adamant in believing the dam must be built. With the surplus energy it would produce, he says, the country could lure industry, which would provide jobs

for its poverty-stricken people. As for those who object that the dam would flood rare plant and animal habitat in Bui National Park, Mensa says, "To hell with them!"

"We're desperate," says Mensa. "We die when we catch malaria, when treatment costs 2,500 cedis [35 cents]."

Ghana recently changed governments in peaceful elections for the first time. How will Ghana score when it comes to protecting its environment? One answer lies in what happens on the Black Volta.

"Everyone wants to look to Ghana to see if we move forward or backwards," said Richmond Evans-Appiah of the Volta River Authority (VRA), Ghana's energy agency. The VRA is paying for studies this year on the impact of a 326-megawatt dam, which it hopes will begin construction in 2002. The dam would create a reservoir covering 26% of the 700-square-mile national park.

Evans-Appiah, who heads VRA's construction office, is well aware that Bui would be one of the first new large dams since the World Commission on Dams report released its findings and urged that any future dams be built with extreme caution and intense public involvement. But VRA officials say mitigation can make up for what's lost when the dam is built. "We need 1,700 additional megawatts of power generation over the next 20 years," said Evans-Appiah. "If we can show in environmental studies that we can relocate all the fauna that will be

impacted, if we can improve management of Bui park, why not generate that?"

Because, critics respond, there is no way to replace what is lost when a dam is built and Ghana can't afford to lose what little land hasn't been altered by farming, logging and mining. Less than 6% of the Oregon-sized country has any protection from development. Ghana already flooded a large area of its riverine land when, in the late 1960s, it created the world's largest reservoir behind Akosombo Dam. That dam flooded some 8,500 square kilometers of the main Volta River – some 5% of the country. Akosombo had huge social and environmental impacts, and has produced significantly less energy than was projected.



Hydropower from the Black Volta has been part of Ghana's energy plans for a half-century, but it took a recent drought and politics to resurrect the idea. In 1998 there wasn't enough water to operate Akosombo Dam, resulting in blackouts.

Although the drought revealed that Ghana is dangerously dependent on hydropower (it gets 75% of its electricity from dams), the ruling party's presidential candidate began to champion the construction of the Bui Dam in campaign speeches as a solution to blackouts. Although the ruling party was defeated, the new administration has chosen to honor a 1999 agreement between VRA and the US company Brown & Root to begin planning it.

Brown & Root is the construction arm of oil giant Halliburton Co., where Dick Cheney was CEO before he ran for vice president of the United States. For the Bui project, Brown & Root formed a consortium with Alstom Hydro, a French firm whose products include power generators, and Dragados, a Spanish contractor.

The companies agreed to design the dam and seek financing. They would build and operate the dam, eventually transferring ownership to Ghana. VRA would pay for environmental studies and buy the dam's electricity.

The country is in no position to borrow money for the US\$500 million project. It recently swallowed national pride and accepted the title of Heavily Indebted Poor Country, a designation by the International Monetary Fund and the World Bank that provides relief for nations staggering under burdens of debt. The project will be Ghana's first private-sector hydrodam. According to a

number of sources, the World Bank has shown no interest in the Bui project to date.

VRA is paying \$1.2 million to Acres International (Canada) and BKS (South Africa) for studies on the social and ecological impacts, which are expected to take at least a year to complete. (As *WRR* readers know, Acres is also involved in plans to dam the Nile in Uganda. It has also been brought to court in Lesotho for its alleged corruption in the Lesotho Highlands Water Project.)

Bui park's mix of river and savannah habitat is "a wealth of biodiversity that cannot be replaced," said William Oduro, wildlife management professor at Ghana's Kwame Nkrumah University of Science and Technology. The park is home to many rare species, including hippos, various monkeys, lions, buffalo, monitor lizards, antelope and leopards. The river provides spawning grounds for many fish species, and its forests support rare birds and butterflies.

VRA proposes buying land around the park to make up for the loss of river habitat and promises money for park management. Don Ackah, who represents Brown & Root in Ghana, was quick to state that Bui is a national park in name only. There are no good roads, no rooms to rent, no campgrounds, he said. Illegal hunting takes a heavy toll. "There's nothing there. The population of animals is not that great," Ackah said, adding that he had never been to the park.

Ghana's national parks are operated by its wildlife division. Director Nick Ankudey refused to be interviewed about the dam. But in a 1999 newspaper article, Ankudey wrote that he supported the project provided thorough environmental studies were done and noted VRA's promise of money for park improvements. While conceding that land would be lost, Ankudey said the reservoir would become a haven for the endangered hippopotamus. He also said that the resulting reservoir would provide tourist opportunities. However, such proposals have not materialized at other reservoirs in the region, in part because of malaria and other waterborne illnesses which increase in the still waters of tropical reservoirs.

Flooding Hippo Habitat

Estimates of Bui's hippo population range from 150 to 350. Another 50 or more inhabit the Black Volta upstream near Wechiau, where a community-owned sanctuary has been created to protect them. These are

continued opposite



Fisherman Simon Beseh and his family will be resettled if Bui Dam is built.

Ghana's last hippos, among only eight or so remnant populations in West Africa.

Oduro, the wildlife professor, has studied hippos for 12 years. He believes they could thrive in a Bui reservoir if it were not too big, if human presence were limited, and if the dam were operated with the hippos' needs in mind. Hydropower reservoirs, with their changing water levels and often steep sides, aren't known for the foliage-covered banks that hippos prefer, and a private sector dam's need to be profitable may make a hippo-friendly management regime a long-shot.

Daniel Bennett, a research assistant at Scotland's Aberdeen University who has studied the Bui hippos, contends that special measures will be needed to provide food for the grass-eating hippos if the dam is built.

Ankudey, the Director of Wildlife, disliked Bennett's creation of a web site suggesting his research was necessary because of the dam's expected impacts. Ankudey accused Bennett of being unethical and deceptive, and withdrew Bennett's permit to work in the park this spring. The angry researcher revised his web site (<http://hippo.50megs.com>) to include addresses where people can write to comment on the dam. He wrote, "Bui National Park has very few friends and I feel obliged to speak because I believe that it is the last fragment of pristine wilderness in the entire Volta system and harbors an exceptionally rich fauna and flora that is in imminent danger of being destroyed without ever being documented."

Bennett scoffs at VRA talk of relocating the hippos. Other biologists agree it would be expensive and difficult to move the animals – considered one of Africa's most dan-

gerous mammals – which must be kept wet and can weigh up to three tons.

John Mason, one of Ghana's leading conservationists, believes the hippos could migrate upstream on their own once construction began. "The hippos will survive, one way or another," said Mason. "They're the least threatened species at Bui."

It's hard to convince Ghanaians that another hydro dam isn't needed to keep their lights on, even though the frequent power outages here are almost always caused by a substandard transmission system. The cost of extending transmission lines – not the availability of power – keeps 46% of the population from getting any electricity at all.

As many as 2,600 people must be relocated if the dam is built. Mike Anane, a writer who crusades against the dam, summed up Bui-area sentiment by relating the reaction he found in two adjacent villages. In Battor, the chief was opposed to the dam. His people were among the 80,000 forced to relocate when Akosombo Dam was built. Many of those who moved still do not have electricity, and battles over land compensation continue three decades later.

In the village of Bui, the chief was excited at the prospect of the dam, Anane said, because he expects its builders to provide him with a large new house.

Alternatives to the Dam

On the opposite side of the country from the dam site, the Rev. Andrew Yambif beamed as he spoke about the solar panels in the courtyard of his church. Solar energy allows for evening services when there could be none before, he said, because power lines don't reach his village. Yambif raised his eyes

heavenward and with a voice of anticipation, said: "Next, ceiling fans!"

The pastor's remote village has benefited from the Renewable Energy Services Project, sponsored by the UN Development Programme and the Global Environment Facility. The project's goal is to lay the groundwork for a private sector photovoltaic industry.

Project director Clement Abavana sees solar power as one way of helping the country of nearly 20 million meet its energy needs. Solar panels already are popping up in the cities as the government raises the price of its long-subsidized hydropower.

Charles Wereko-Brobby, an energy expert who advises President John Kufuor, talks enthusiastically about the potential of conservation in Ghana. There's wide agreement that the country could reduce its energy needs by 25% with more efficient industries, appliances and energy-conscious consumers.

Wereko-Brobby is not excited about Bui Dam, but he has high hopes for the planned West Africa Gas Pipeline. The 370-mile pipeline, which is much farther along than Bui Dam, would pump natural gas under the ocean from Nigeria's oil fields. "If I can get natural gas cheaply into Ghana, I can generate electricity more cheaply than with a dam," he said. The pipeline would also improve regional air quality by reducing gas flaring in Nigeria. The multinational companies there flare almost 2 mn cubic feet of natural gas daily – more than anywhere else in the world. According to the World Bank, gas flared in Nigeria is equivalent to total annual power generation in sub-Saharan Africa. Major coastal industries eagerly await the pipeline, which could be built as soon as 2004, including the Volta Aluminium smelter, owned by America's Kaiser Aluminum. The company once consumed 95% of Ghana's hydropower.

Besides considering energy alternatives as they ponder the need for a dam, Ghana's officials will need to consider the effects of global warming on its rivers. Recent climate change studies of three Ghanaian river basins predicted decreases in rainfall and groundwater recharge of rivers. Coupled with increased water use by a growing population, that led Ghana's EPA to warn of serious consequences, including reduced hydropower generation.

In short, Ghana could sacrifice the heart of Bui National Park for hydropower, then lack a steady supply of water to run the turbines. ■

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Handbook of Water Use and Conservation, by Amy Vickers. Published 2001, WaterPlow Press. \$99.95 (order from www.waterplowpress.com).

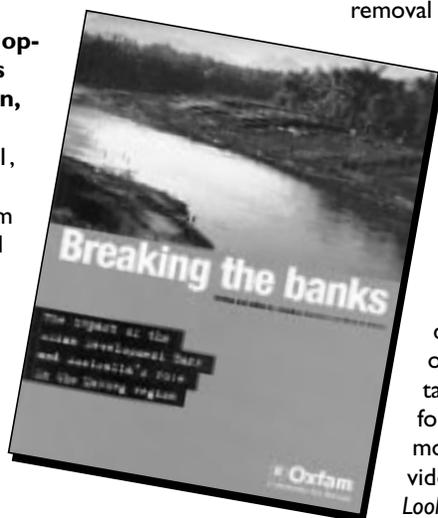
The average American uses 101 gallons of water per day (gpd), almost three times what an Egyptian uses and about double that of the average Thai citizen. Ironically, the dry Western states have some of the highest usage – about 155 gpd in Albuquerque, NM and a whopping 230 gpd per person in Phoenix, AZ. With the typical American home using 1,000 gallons per year just on their lawns, what's a drylands water planner to do?

First, they should turn to this book and its 464 pages of solutions on how to trim wasteful water usage. The author asserts that "Systemwide demand reductions of at least 25% from conservation may be a reasonable goal for many North American water utilities." No one is spared from Vickers' water-conserving plan: she finds serious water savings for the smallest lawn to the largest farm, from urban zoos to industrial cooling towers. The handbook describes technologies and practices to conserve water in homes, businesses, industries and farms. Information is clear, well organized, and thorough. The book offers 10 key steps to a successful water conservation program, describes how to conduct water audits, gives data on the water- and energy-savings and costs of the measures described, provides case studies of good examples to follow, and much more. With this book, any excuses for wasteful water usage go down the drain.

Breaking the Banks: The Impact of the Asian Development Bank and Australia's Role in the Mekong Region,

by Jonathan Cornford and Michael Simon. Published 2001, Oxfam Community Aid Abroad. AU\$17.95 (order from <http://www.caa.org.au> or email publications@caa.org.au).

Breaking the Banks explores the activities of one of the most influential yet little known institutions in the Asia-Pacific: the Asian Development Bank. This book looks at the role of the ADB within the countries of the Mekong region, and documents how dams, roads, forestry and other



projects supported by the bank are directly threatening the livelihoods of rural people throughout the basin. The book uncovers the real human impact of the rapid social and economic change being driven by institutions like the ADB. Competition for natural resources – rivers, forests and land – is identified as the most important site of struggle between poor rural communities and the new global forces. It draws together a range of writings and analysis from local and international organizations, institutions and individuals that explore this theme.

The title is a metaphor for the annual cycles of the Mekong River. Millions of people live out their lives along its banks, tending gardens, fishing, washing and fetching water. Its floods bring fertile silts and support fisheries that form a vital link in the chain of life of subsistence communities along the river's 4,800-kilometre length. The publication is a wake-up call for all donor countries to the ADB, and the need for public pressure to ensure the bank becomes increasingly accountable for the money it spends in the international arena.

Dam Removal: A Citizen's Guide to Restoring Rivers (book) by River Alliance of Wisconsin & Trout Unlimited (2000), and **Taking a Second Look: Communities and Dam Removal** (video) by the River Alliance of Wisconsin, Trout Unlimited, American Rivers, the Atlantic Salmon Federation & the Natural Resources Council of Maine (2000), by Green Fire Productions (order from www.wisconsinrivers.org/SmallDams/toolkit-order-info.html, or e-mail wisrivers@wisconsinrivers.org).

This toolkit is a good package for anyone interested in learning about options for dam removal. The 130-page handbook offers a step-by-step process for pursuing dam

removal as a river restoration tool. It includes chapters on researching a dam of concern, gathering information on repair and removal options, tools to use in pursuing a dam removal, developing a strategy and tactics to advocate for removal, and more. The 22-minute video *Taking a Second Look* features case studies of communities that have removed

dams in Wisconsin, Maine and California, and addresses many issues and concerns that come up in the dam repair/removal decision-making process. The video highlights before-and-after stories of river restoration in three communities.

Both of these resources focus on small dam removal in the US, but could offer lessons for other parts of the globe. The video is ideal for introducing skeptical individuals to the notion of dam removal as a logical, attractive option in river management. The handbook is an excellent resource to guide someone through the process of helping a community decide whether to restore a river by removing a small dam. The toolkit takes great pains to avoid overtly advocating for dam removal, but the message comes through loud and clear – dam removal can be the best option to deal with dams that simply don't make sense.

Hydrogen Futures: Toward a Sustainable Energy System, by Seth Dunn. Published 2001 by Worldwatch Institute. \$5 (order from www.worldwatch.org).

What do Iceland, Hawaii, Germany and Japan have in common? All are working diligently to convert to a "hydrogen economy," based on fuel cell technologies now being developed by a number of companies. These devices could eventually replace internal combustion engines and fuel everything from power plants to personal electronics. All the major automakers are racing to have fuel-cell-powered vehicles on the market: Toyota recently shocked the industry by announcing it would start selling fuel-cell vehicles in Japan by 2003, and GM aims to be the first car company to sell one million fuel cell vehicles (it also just came out with a washing-machine-size fuel cell to power a single house). The devices have the potential to address the energy evils of air pollution, climate change and geopolitical instability due to oil-import dependence.

Fuel cells are powered by hydrogen, the most abundant element on the planet, and are a virtually clean technology – if the hydrogen is derived cleanly. But as this report reveals, governments and industry are "keeping one foot in the hydrocarbon economy" and are pursuing a route that would use gasoline as the source of hydrogen, rather than the cleaner method based on natural gas or renewables. Not surprisingly, the Bush administration is at the bottom of the heap when it comes to fuel-cell innovation, and is currently allocating five times more for R&D in "clean coal" than for fuel cells, and 10 times more for nuclear.

continued opposite

Colombian Activist continued from page 1
aid to Colombia would have devastating consequences for the unarmed civilian populations caught in the crossfire. He also spoke of the impacts that Urrá Dam had brought to his community.

Kimy's disappearance caused a flood of letters to the Colombian government from groups and individuals around the world. 800 indigenous people also mounted a search of nearby farms and ranches to try and locate him. The Embera painted their

bodies in their traditional way, and marched one behind the other, women on one side of the road and men on the other for hours in the hot and steamy region.

Twenty days after Kimy's kidnapping, after intensive pressure from Colombians and the international community, the government responded by sending a high level commission and the Minister of the Interior. The results of the visits were a commitment by the Minister of the Interior to assure the

implementation of the negotiated agreements. The Minister of the Interior's visit to the region also prompted the creation of a Clarification Commission, which includes the UN High Commissioner in Colombia, the office of the Attorney General, and the Catholic Church, to investigate the facts related to Kimy's disappearance. As this article goes to press, this matter is pending until the new Attorney General takes office. ■

Auburn Dam continued from page 5
have backed down after the bill's sponsor, Senator Rico Oller (R-San Andreas), could not answer basic questions about the dam. In addition, a federal report done several years ago, "The American River Water Resources Investigation" by the US Bureau of Reclamation (1997), suggested that more water could be created at a lower cost through a conjunctive use program than through a new reservoir on the American River.

In the past decade, at least five similar Auburn Dam bond proposals have been rejected because of the project's high costs (it would be the nation's most expensive dam ever), questionable benefits and serious environmental damage. More than 45 miles of the north and middle forks of the American River would be flooded by the dam. If the bill is not taken up again this year by the state legislature – a likely scenario – it will mean the end of yet another skirmish in the long Auburn Dam war.

US Congress Weighs In

Just a few weeks after the demise of the Auburn legislation in California, the Auburn Dam's most obsessive booster, Congressman John Doolittle (a Republican representing the dam site area), was forced to withdraw his highly controversial proposal to authorize yet another feasibility study for the dam. The congressman's stealth move, which tied the study's approval to legislation to improve ongoing flood protection for Sacramento, was hidden in a giant Congressional appropriations bill.

But the move brought Doolittle nothing but embarrassment after Sacramento officials, along with Rep. Robert Matsui (D-CA) and some of Doolittle's Republican colleagues, rallied against the provision. They easily argued that such a linkage could spell doom to the city's much-needed flood safety program, which can't afford to be weighted down with such a politically charged project.

Word has it that Congressional leaders didn't want to be associated with yet another anti-environmental issue. At press time, however, two other troubling Doolittle measures remain in the Appropriations bill, including one that halts commercial rafting on the north and middle forks of the American River pending environmental studies on the impacts of rafting. The affected segments of river are identical to those threatened by the dam. With an estimated 12,000 people enjoying commercial river trips and witnessing the wonders of the river canyons every year, it is perhaps not surprising that the congressman is hoping to put a stop to them. Friends of the River is working to have that provision deleted, too. ■

The author is with the Sacramento-based group Friends of the River. For more information about Auburn Dam, visit www.friendsoftheriver.org or contact Ron Stork at (916) 442-3155 x220 or rstork@friendsoftheriver.org.

Run-of-River continued from page 9
hosted 15 percent fewer species after damming "because regulated shorelines were narrower than natural riparian zones."

Fisheries are harmed just as easily by run-of-river projects as they are by storage dams. In both cases, the dam wall presents a barrier to migrating fish.

The Pak Mun Dam has wiped out 56 species of fish from the Mun River because the dam blocks their rainy season migration routes, the 60 sq.km. head pond inundated their spawning grounds, and the species' inability to jump has rendered the project's

ill-conceived fish pass of little use. Some 100 additional species in the Mun were negatively affected by the dam's construction, and the fish catch directly upstream of the dam has declined 60-80% since the project's completion, resulting in an economic loss to villagers of about \$1.4 million per year, according to the WCD. Affected villagers successfully lobbied their government to open the gates of the dam this year, which brought immediate improvements to their fish catches.

Other run of river schemes with serious fisheries impacts include the Theun-Hin-

boun Dam in Laos, which resulted in a serious reduction of local communities' fish catch after it was constructed, and the proposed Bujagali Dam in Uganda, which will inundate a falls that harbors rare endemic fish species. The Ugandan government approved Bujagali contingent on the project including a fish pass. However, the project's Panel of Experts writes, "The Panel knows of no cases anywhere in Africa where fish ladders have been used successfully."

Clearly, run-of-river projects can have serious impacts, and must be given the same scrutiny as other dams. Run-of-river dams may be less destructive than storage dams, but they can also be just as capable of pushing species to extinction or families further into poverty. As with other large dams, run-of-river projects should be subject to review against the World Commission on Dams' guidelines. ■

In Print continued from page 14

Hydrogen Futures lists 10 policies that governments can introduce to help build a hydrogen economy, from tax incentives for vehicles to phasing out the roughly \$300 billion spent annually to subsidize fossil-fuel use worldwide. "Governments should hasten the hydrogen transition by promoting

innovations that have potentially enormous long-term benefits – just as the US government did with transistors, computers and the Internet."

With Bush in office, it will take intense public pressure to ensure these ideas are even heard. Iceland, here we come? ■

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