

NGOs Protest World Bank Position on WCD Guidelines for Dams

by Peter Bosshard

In a March 19 letter to World Bank President James Wolfensohn, 87 groups from 30 countries protested the position taken by the Bank so far on the World Commission on Dams (WCD) report. The groups, all of which were involved in the WCD process, say the Bank's response to the report has been "ill-advised, disappointing and in parts inappropriate."

The WCD was an independent body whose 12 prominent members represented different perspectives involved in the large dams debate. The Commission conducted the first-ever comprehensive evaluation of the impacts of large dams. The WCD report recommends that all water and energy projects should be based on a balanced assessment of needs and options, that all decisions to build dams should have the agreement of dam-affected communities, and that optimizing existing water and energy facilities should have priority over building new projects.

After the WCD report was published last November, a Bank mission set out to consult those governments most actively involved in

building large dams. As a result, the World Bank informed the WCD Forum in Cape Town in February that it would not adopt the WCD's guidelines, but would only use them as a non-binding reference when considering new dams. At the same time, NGOs say, Bank representatives are privately lobbying governments and other institutions to reject the WCD's recommendations.

Said Bank senior water adviser John Briscoe at the February WCD meeting, "If the WCD recommendations and guidelines ... are to be taken as a checklist of requirements to be 'complied with' and 'conformed to', then they are strongly opposed by all the governments we have consulted."

Yet NGOs believe the consultation process has been purposely skewed by the Bank to get an anti-WCD response. "NGOs certainly are interested in having an active dialogue with borrowing country governments on the implementation of the WCD report," says Himanshu Thakkar of the South Asia Network on Dams, Rivers and People, one of the authors of the NGO letter. "Yet if the World Bank simply consults the

water and energy ministries which build the largest dams, it should refrain from pretending to be an honest broker, but should make it clear that it represents one interest group in a conflictive debate."

The NGOs point out that the Bank was actively involved in the WCD process from the very beginning, and has "quite likely had more opportunities for inputs into the process than any other institution." The letter notes that the Bank has repeatedly "applauded the WCD as a model for resolving conflict through dialogue."

The letter also calls on the Bank to comprehensively adopt the recommendations of the WCD, to establish independent reviews of its planned and ongoing dam projects, to establish mechanisms for providing reparations to communities harmed by past dams, and to place a moratorium on funding new dams until it has implemented the WCD guidelines. The letter points out that many international financial institutions, government agencies, scientific bodies and industry associations have already come out in support of the WCD recommendations. ■

IN THIS ISSUE

- Thailand:** Pak Mun Dam's gates are opened, ending a long standoff between affected communities and the government. [Page 1](#)
- Commentary:** Bihade dlable adoj! onowue[neouawo eiooas]d]. [Page 2](#)
- China:** Resettlement at Three Gorges gets ugly. [Page 3](#)
- Africa:** A cautionary tale about "dam development" from Lesotho. [Page 4](#)
- Day of Action:** A round up of actions from around the globe. [Page 6](#)
- Turkey:** New report finds Illisu Dam a disaster waiting to happen. [Page 7](#)
- The Atmosphere:** Dams are not clean and green, and are adding significantly to global warming. [Page 8](#)
- Brazil:** A proposal for Belo Monte Dam on a tributary of the Amazon is full of holes. [Page 10](#)
- News Briefs:** All the dam news that's fit to print. [Page 12](#)
- Latin America:** In addition to its many other impacts, Yacyretá Dam is harming nearby wetlands. [Page 14](#)

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Pak Mun Dam Gates to Open

by Aviva Imhof

In a victory for villagers affected by Pak Mun Dam in Thailand, the new Prime Minister, Thaksin Shinawatra, has agreed to open the dam's gates for four months this year to conduct studies on fisheries and social impacts. In exchange, the Assembly of the Poor has ended its marathon protest outside Government House, where several hundred people had been camping since last July.

Under the terms of the agreement, the gates of Pak Mun Dam on the Mun River in Ubon Ratchathani Province will be opened from May to August while fisheries and social studies are conducted. A decision will then be made on whether to allow an indefinite opening of the dam gates. The exact dates of the spillway opening, and the Terms of Reference for the studies, have been delegated to a committee composed of a number of Thai academics. The committee was to make its recommendations as this issue went to press.

The Pak Mun Dam was completed in 1994 with US\$24 million in funding from the World Bank. From the outset, the project – a “run of river” scheme that was supposed to have minimal impacts on river ecosystems – was highly controversial due to the predicted impacts on the rich and productive fisheries of the Mun River, the largest tributary of the Mekong. As a direct result of the dam, more than 20,000 people have been affected by

drastic reductions in fish populations upstream of the dam, and other changes to their livelihoods. Since 1999, villagers have been living in a makeshift protest village at the dam site, demanding that the dam gates be permanently opened and the river restored.

People affected by the dam are cautiously optimistic about their prospects for the future. Said Mrs. Charoen Kongsuk, “We are happy with the decision made by the government, but the government is composed of politicians, who do not always keep their promises. Therefore, we are waiting to see if the government complies with the agreement and opens the dam gates for four months this rainy season. We hope that this will be the first step toward permanent opening of the dam gates and restoration of the Mun River.”

Villagers say they will stay at “Long-lasting Mun River Village 1,” the protest village at the dam site, until the dam gates are permanently opened and reparations have been made to affected communities. About 500 people are currently living there.

The Electricity Generating Authority of Thailand (EGAT), the owner and operator of the dam, has attacked the government's decision. EGAT claims that opening the dam gates would result in an economic loss of about \$15 million, and that Thailand cannot afford to forego the power that would be generated by the dam. This is despite the

fact that Thailand currently has a power surplus of around 40%.

In addition, EGAT claims that opening the dam gates will destroy the fish cages they have established in the reservoir. The World Commission on Dams (WCD), however, found that reservoir fisheries at Pak Mun had been a failure, and that the actual fish catch in the reservoir and upstream is 60-80% less than in the pre-dam era, resulting in an economic loss to villagers of about \$1.4 million per year. The WCD recorded that 169 out of 265 species of fish in the Mun River were affected by the construction of the dam. Of these, 56 species have completely disappeared from the Mun.

The decision to open the gates at Pak Mun was one of several decisions made by the Cabinet concerning dam projects in Thailand. The government will appoint a panel to search for plots of land of 2.4 hectares each for over 400 families affected by the construction of Sirindhorn Dam, completed in 1969. These families were never given compensation for their lost land, and have been squatting on government-owned land for the past 30 years. Also, tests will be conducted to measure the volume of dust particles in the air in communities around Lam Ta Khong Dam in the wake of rock blasting. Finally, the government has also agreed to suspend con-

continued on page 14



Thai villagers working to free the Mun River of its dams held a mass demonstration on March 14, The Day of Action Against Dams (see p. 6 for more events).

Photo: IRN

No Aloha for the ADB



The Asian Development Bank (ADB) is suffering a crisis of legitimacy from which it may never recover. The little-known younger sibling of the World Bank in early May faced the biggest demonstration of its kind in a donor country. More than 1,000 Hawaiians, together with NGOs and affected peoples from Asia and the Pacific, marched on the ADB's Annual Meeting in Honolulu to declare "No Aloha for the ADB." The march was the culmination of a series of events in Hawai'i aimed at raising awareness about the Bank. Native Hawaiians used the meeting to raise awareness of US appropriation of their lands for golf courses and resorts.

The activities in Hawai'i, following protests at last year's Annual Meeting in Thailand, seriously rattled the bank. The Japanese-controlled institution, which had hastily shifted its meeting from Seattle to Thailand in the aftermath of the World Trade Organization demonstrations, suddenly discovered there was no place to hide. Honolulu's police force, however, seemed to relish the idea of a Seattle-like affair, using the opportunity to buy \$500,000 in riot gear and stun guns, and implementing a whole series of repressive security measures. Their actions embarrassed even the ADB.

This is just the latest spiral in the ADB's fall from grace. The institution – which since 1966 has financed numerous destructive large-scale infrastructure projects – has been seriously battered over the past few years. The bank has drawn fire for its enthusiasm to build dozens of large dams in the Mekong basin, and its financing of three large dams on tributaries of the Mekong. One project in particular has tarnished the bank's image. The Theun-Hinboun Dam in Laos has given bank staff numerous headaches since 1998, when it declared the project a "winner" with "little for the environment lobby to criticize." Since that time, the bank has been forced to admit that the project has had a serious impact on the livelihoods of more than 25,000 villagers who have lost fisheries, vegetable gardens and freshwater drinking sources as a result of the dam. Today, villagers are still waiting for compensation, and the new mitigation and compensation program is seriously flawed.

More recently, the Bank has been facing an even greater headache from the 60,000 or so Thai villagers whose livelihoods will be affected if the bank-funded Samut Prakarn Wastewater Treatment Plant is completed as planned. The plant will release 525,000 cubic meters per day of treated effluent into the sea, destroying shrimp and shellfish breeding grounds and decimating fisheries. This project is a prime example of ADB corruption, bureaucratic bungling and pure incompetence. During project implementation, the site was hastily relocated to its current location 20 kilometers away from the original site, without an environmental impact assessment, contrary to ADB policies. Allegations of corruption surround the purchase of land for the project, implicating some senior bank staffers.

Last year, several thousand villagers protested at the bank's Annual Meeting demanding that the wastewater project be halted. The bank refused, but referred investigations to its Anticorruption Unit, and commissioned a bogus "independent review." Last month, dissatisfied with the bank's responses, the communities filed an inspection panel request, a first for the ADB. The bank's Board will decide this month whether to refer the project for inspection. If accepted, it will be a serious test for the bank.

The ADB's public relations machine has recently stepped into overdrive to try to repair its damaged image. In 1999 President Chino declared that the bank's overarching goal had shifted to "poverty reduction," and ADB staff were directed to "think poverty" at all times. This year, the bank established a new NGO unit to build better relations with nongovernmental organizations monitoring the institution, and hired a Massachusetts-based company, the Consensus Building Institute, to train ADB staff on how to relate to NGOs during its annual meeting events.

Yet for affected peoples and NGOs from around the region, it is simply too little, too late. Non-governmental and peoples' organizations from around the Asia-Pacific region presented ADB President Chino with a petition at the Honolulu meeting, in which they called the bank "one of the most non-transparent, undemocratic and unaccountable organizations in existence." They demanded that it "recognize the error of its ways and yield the space to promote alternative strategies of development that truly serve the people's interests." Whether the bank will heed their call remains to be seen. But one thing is certain: there's trouble in paradise for the ADB.

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Arrests, Intimidation Confirm Human Rights Abuses at Three Gorges Dam

by Doris Shen

Five representatives from a town slated to be submerged by Three Gorges Dam have been arrested for circulating petitions to protest corruption in the resettlement program.

According to a recent report by Chinese journalist Wang Yusheng, eight farmers elected from Yunyang County planned to travel in early March to Beijing to present party officials with petitions detailing resettlement grievances in their township. Over the past four years, villagers across the areas slated to be submerged have been organizing themselves into unauthorized associations to protect their interests. The associations have already sent numerous petitions to Beijing protesting corruption by local resettlement officials.

Before these representatives could leave their township, county police arrived to arrest them. Two were caught. Three others, including He Kechang (who is seen as the leading petition drive), escaped to the city of Yichang. At Yichang, He was attacked and robbed by two men he believes were sent by Yunyang county officials. He and his two colleagues escaped from the thugs but were then arrested at their hotel by Yunyang county police. The five representatives are expected to face jail sentences of 3-5 years for "disturbing social order and Three Gorges resettlement."

According to a sociologist working closely with the dissenting villagers, He Kechang managed to get a message to his wife and family that he is being tortured physically and mentally at the detention house and may die within months. The police have not allowed his family to visit him.

If completed, Three Gorges Dam would displace close to two million people, making it the world's largest forced resettlement for a single project. Under the current authoritarian political climate, affected people have no legal recourse or rights to protest project impacts.

To speed up the process of evictions, the secretary general of Yunyang County in January issued a mandate of "government sanctioned resettlement." This allows resettlement officials to use police force to relocate villagers. Anyone opposing resettlement can now be charged as a criminal.

There was also violence recently against resettlers in Kaixian, another county heavily affected by the dam. Local authorities dis-



Direct public criticism of Three Gorges Dam is virtually impossible in China. These expatriate Chinese activists were protesting the project in France.

patched police and soldiers to break up demonstrations by angry farmers affected by incoming resettlers moving into their area. These villagers had been forced to share land and other resources with project resettlers without compensation. During the protest, soldiers seriously injured 19 people and police detained 28 villagers, according to Chinese sources.

Wall Street Ties

The recent project-related human rights abuse prompted IRN to write Wall Street bank Morgan Stanley, urging them to immediately cease all direct and indirect financing of Three Gorges Dam. (The letter is posted on www.floodwallstreet.org) Representatives

from Morgan Stanley said the issue would be brought to the attention of top management.

Since 1995, China International Capital Corporation (CICC), which is 35% owned by Morgan Stanley, has served as an advisor on overseas fundraising for the Three Gorges Project Development Corporation. In January 1999, CICC purchased \$250 million in bonds for the Three Gorges Project Development Corporation. Board members of CICC include Morgan Stanley executive management.

China Development Bank, a state-owned bank established to finance large-scale infrastructure projects, lists the Three Gorges Dam as its top loan commitment. In 1997 and 1999, US investment firms, including Morgan Stanley, helped underwrite \$830 million in CDB bonds. Most recently, in February 2001, CDB announced plans to auction \$22 billion in bonds.

In its letter, IRN specifically asked Morgan Stanley to clarify whether either CICC or Morgan Stanley is involved in purchasing these latest CDB bonds.

Project authorities have stated that they need to raise almost a quarter of the dam's official price tag of \$24.5 billion from overseas. ■

Ertan Dam Still in the Red

Ertan Dam, the largest hydroelectric project ever to be built in China and one of the largest dams in the world, is expected to lose some \$150 million in the coming year. According to the *South China Morning Post* (March 13), the project is asking for a 10-year grace period in the repayment of its loans, including some from the World Bank.

The dam, on the Yalong River in Sichuan Province, cost a total \$3.4 billion, and garnered the World Bank's largest-ever project loan (\$1.2 billion). The project has been losing money since its turbines first started producing electricity in August 1998, and has run at just half its

capacity since its commissioning. Losses continue to grow despite raising the project's cost of electricity last year. Due to the project's high costs and changes in China's power industry, Ertan's electricity is significantly more expensive than that produced by smaller power stations that have sprung up since ground was first broken for Ertan in 1991. The region served by the dam now has an energy surplus.

According to an Ertan spokesman, the Finance Ministry – the guarantor of overseas loans – had not yet reached an agreement with the World Bank over the repayment delay.

Back to the Drawing Board

A Cautionary Tale of “Dam Development” from the Lesotho Highlands

by Ryan Hoover

The following is an excerpt from a new IRN report, “Pipe Dreams: The World Bank’s Failed Efforts to Restore Lives and Livelihoods of Dam-Affected People in Lesotho.” The report describes the human fallout from Africa’s largest dam project, the World Bank-funded Lesotho Highlands Water Project. The World Bank considers the LHWP’s resettlement program as being “best practice,” but it has left tremendous social problems in its wake. This excerpt details the project’s many failed attempts to bring development schemes to dam-affected communities.

The dams of the multi-billion-dollar Lesotho Highlands Water Project (LHWP) have dispossessed nearly 30,000 people of their land, depriving them of their livelihoods as farmers and herders. Losing one’s livelihood is traumatic under any conditions, but for Lesotho’s rural small farmers – forced to find an entrepreneurial niche in a very weak economy where less than 40% of the workforce is fully employed – the experience has been devastating.

The multi-dam LHWP scheme began in the late 1980s with a promise that has proved virtually impossible to meet: that those affected by the project would be “enabled to maintain a standard of living not inferior to that at the time of first disturbance.” To that end, the Lesotho Highlands Development Authority, the parastatal charged with constructing the project, unveiled a Rural Development Plan (RDP) in 1990 that budgeted \$36 million over 12 years for a wide range of development projects intended to benefit affected people. Required by the World Bank, such development plans are intended to restructure the disrupted regional economies that big projects leave in their wake. Academics and government officials lauded the RDP, describing it as one of the best in Africa.

Unfortunately, in spite of the huge budget, highly trained personnel and many good intentions, the program failed to meet its objectives. The optimism and enthusiasm of project consultants was no match for the harsh economic climate of the Lesotho highlands, with its near total lack of opportunities for small business creation. As a

result, the politicians’ promises of a better life for all people affected by the dams are far from fulfilled.

The following are specific examples of development programs gone awry.

High Cost Horticulture

Lesotho Highlands Development Authority (LHDA) consultants proposed \$1.6 million worth of “improved cultural practices” for agriculture that they hoped would lead to higher yields and “attractive gross margins on vegetables and fruit.” The consultants believed the “stagnant” state of agriculture in pre-LHWP areas resulted from local people’s “failure to innovate.” To remedy this situation, LHWP determined to introduce hybrid seeds, improved tilling techniques, fertilizers, pesticides, soil conservation methods and a pilot irrigation project.

Predictably, like so many past agriculture projects in Lesotho, the RDP’s program failed to make much of an impact. Hybrid seeds, fertilizers and pesticides are expensive, and the costs of these measures made farming a losing proposition. While highlands farmers’ yields are relatively low, their expenses are even lower because they use very few inputs. Before LHDA moved into the area, only 0.2 percent of fields near Katse Dam were fertilized, and only 8.1 percent were sown with purchased seed. Because of the low inputs, farmers’ profits in the area average nearly \$30 annually (by comparison, in the lowlands, where the use of inputs is high, the average farmer’s yield was a \$13 loss). Predictably, few farmers increased their use of inputs and the ones who did struggled to avoid operating at a loss. Nearly seven years after the project



Photo: Don Edkins

Left behind by Mohale Dam.

began, only 77 of the 2,345 households which lost arable land to Katse and Muela had participated in LHDA’s improved seed multiplication project, and the majority of these could participate only because fertilizers and insecticides were provided by the LHDA.

The horticultural program’s irrigation project faced an even more dubious future. LHDA hoped its 2.1-hectare pilot irrigation scheme would encourage local farmers to grow produce for sale in the lowlands and South Africa. The project document, however, was gloomy about irrigation’s potential: “Few, if any, irrigation schemes have been successful in Lesotho, even when established on the best lowlands, within easy reach of markets and with adequate water supplies.” It even admitted, “The project is not justified economically... However, given LHDA’s obligation to develop the area by the opening of new opportunities to its inhabitants, the project includes irrigated

horticulture. Its implementation, however, can only proceed in the knowledge that it has a high risk of failure." Their doubts were realized, and the project was unable to achieve financial viability.

Ephemeral Water Supply

The RDP also made a commitment to "assure that all 3,770 households within the local catchments of Katse and 'Muela reservoirs have access to engineered drinking water from public standpipes by the year 1995."

Five years after the target date, only three villages have working water systems and at least five primary schools still have no water supply. Many of the systems that were installed quickly failed and have not supplied water in almost three years. LHDA claimed the systems had been vandalized by herdboys. However, a government inspection team reported seeing no evidence of vandalism – but did remark on finding taps constructed below the national standard and sourced to weak, intermittent springs.

A high-ranking LHDA official who spoke under condition of anonymity explained the project's broken promise quite candidly: "We made major commitments without intensive assessment of the real water situation in the catchment area." Pumping water from the reservoir is apparently not a solution, because "the depth of (reservoir) drawdown makes pumping impracticable," according to LHDA. Curiously, this was not enough of an obstacle to prevent the Katse engineers' village from pumping reservoir water into their homes, restaurants and swimming pools.

Misguided Skills Training

Skills training programs for affected people have failed. The LHDA's Rural Development Centre (RDC) in the Katse area was intended to train seriously affected people in skills such as woodworking, sewing, masonry, and poultry raising. These areas offer, at best, limited opportunities for entrepreneurship. In 1998, the Lesotho NGO Highlands Church Action Group conducted a study of training recipients from villages around Katse Dam. The study found only 8.6 percent of them had been able to generate any sort of income with their new skills, and none were able to use their skills to establish a new livelihood. They also reported that their training certificates failed to "open doors" with LHWP construction contractors, who claim the certificates are of low standard. "I took my training certificate to the LHWP three times, and each time they told me it is better for me to throw my certificate away," reported one. One of LHDA's rural training staff admitted privately that eco-

nomie realities in the highlands meant the odds of a majority of affected people restoring their livelihoods were "virtually nil."

In January 2001, LHDA closed the Rural Development Centre down. Representatives of the Transformation Resource Centre (TRC) believed this move to be "long overdue" and noted, "the (RDC) has just been a money making play for foreign consultants who kept on proposing their continued presence."

The abandoned RDC workshops, offices, dormitories, and living quarters are less than a mile away from another notorious failed development program: the Thaba-Tseka Project. James Ferguson, author of *The Anti-Politics Machine*, chronicles the troubled history of this project, paying special attention to the fact that, while the methods and means to achieve "development" are reviewed and reworked constantly, the belief in the possibility of "development" is rarely questioned. Planners' belief appears to be that the proper "development" tool is yet to be discovered. Nobody is prepared to admit that the impediments to "development" in contexts like the rural mountains of Lesotho are such that they may negate any possibility of village-level success.

Paved with Good Intentions

LHDA built many kilometers of feeder roads around Katse Dam in part to stimulate development and reduce the area's isolation. Ironically, the isolation of the area may have been the only thing that kept the local economy afloat. LHWP access roads encouraged the spread of South African products in the formerly isolated LHWP areas, where local producers' only competitive advantage was their vicinity to their customers. Because South African goods are cheap, of relatively high quality, and bring a certain amount of prestige, they stifled the marketing of local commodities. Shops in the most remote villages surrounding LHWP dams are now stocked almost exclusively with South African goods.

Farmers who managed to find buyers for their crops previously could no longer do so because imported products were often cheaper. One farmer managed to compete for several years, but in 2000 "previous markets have ceased to be available. Fifty bags of potatoes remain unsold because a verbal commitment was not honored, while an entire planting of carrots and of early maturing cabbage has gone to waste because of failure to find a market."

Practice Makes Perfect?

The RDP experience was a bitter one for the LHDA and its donors. Complaints and

pressure from affected people and NGOs about the failing RDP mounted to crisis proportions. The problems even threatened World Bank funding for the next phase of the project.

Therefore, in 1997, LHDA unveiled a new and improved development program, the Resettlement & Development Action Plan (RDAP). Among the RDAP's commitments are new crop and livestock production programs; the provision of water supply; the promotion of tourism, and the development of a credit facility to stimulate entrepreneurship. All told, the RDAP's development plans called for approximately \$13 million over a six-year period.

So far, the problematic design and sluggish implementation of Katse Dam's RDP has been replicated by the RDAP. In 1999, the World Bank's Panel of Experts noted with alarm that "emphasis on physical removal and compensation activities continued to take precedence over development activities," and "only a small minority of households" had been involved in development programs a full year after they had been resettled from Mohale. The following is a description of some of the projects contained in the program.

Almost 40 percent of the RDAP's development budget (approximately \$5 million) was for a "Crop and Livestock Production" program that resolved to "provide average household's food requirements plus extra for cash sales." Unfortunately, the program's plans continued to prescribe interventions that failed to produce significant results at Phase 1A, including the use of very expensive inputs. It remains to be seen whether farmers who adopt the consultant's proposals will be profitable.

Project officials also introduced paprika as a new cash crop. Unfortunately, they introduced it "on the basis of verbal interest of one entrepreneur in South Africa," according to the project Panel of Experts, and without properly training people how to store and market the crop. The farmers were left with huge amounts of paprika peppers, a crop not used in Lesotho, without guaranteed buyers. Highlands farmers cannot afford to raise unwanted paprika peppers in fields that could produce maize that would feed their families.

Ego-Tourism

The consultants' overly optimistic ideas for "eco-tourism" on the banks of Mohale reservoir would be laughable if they did not cost hundreds of thousands of dollars to contrive. Confident that "tourism will be an impor-

continued on page 14

Unleashing the Flood on the Day of Action

by Gila Neta

The fourth annual International Day of Action Against Dams and for Rivers, Water, and Life on March 14 was the first since the World Commission on Dams released its cutting-edge report, and dam-affected people the world over took advantage of the added leverage in their events. The WCD's strict guidelines for dam projects emphasize public acceptance, negotiated agreements and benefit sharing, and were a focal point of many of the day's events.

Around the world on March 14, dam-affected communities not only demanded reparations for past damages caused by dams, but also called on national and international agencies and institutions to implement WCD guidelines and put an end to the financing and building of destructive projects. Herein we describe just a few of the more than 60 events held worldwide.

Hundreds of thousands of citizens flooded the streets in Madrid to protest Spain's National Hydrological Plan which includes plans to divert 26 billion gallons of water per year from Spain's largest river, the Ebro, to the dry regions of the South. The project will cause serious devastation to the Ebro by raising salinity levels, according to ecologists. Environmentalists, farmers and union members are all calling for Spain to cancel the plan and to use available water resources in the South more efficiently.

In Brazil, thousands of people from all over the region rallied at the Brasilia Office



Thai activists held a Mun River rally, walking from dam to dam and ending at Pak Mun dam.

of the Ministry of Mines and Energy, demanding "democratization of Brazilian energy policy and implementation of energy alternatives." The Movement of Dam-Affected People (MAB) also occupied various dam sites throughout Brazil, demanding a halt to new dam construction until problems caused by existing dams in Brazil are solved.

South African activists organized a tour of the proposed Skuifraam Dam site near Cape Town. The Environmental Monitoring Group, the Environmental Justice Networking Forum and Skuifraam Action are helping to mobilize people from local townships to protest the

water supply dam, which would have devastating ecological impacts, and is being pushed through without first attempting to implement water conservation measures.

US groups went on a nine-day "Sustainable Water Project" road show which travelled in Western states through which the Colorado River flows, to plead for increased flows for the sickly river. The Colorado no longer flows to its mouth in Mexico due to excessive water extraction, and the groups are pushing for a 1% increase in river flows to help restore its delta. Led by the Glen Canyon Action Network (GCAN) of Moab, Utah and Living Rivers of Phoenix, Arizona, the roadshow drove an empty water truck, symbolizing the lack of water in the delta, to rallies in Salt Lake City, Albuquerque, Phoenix, Las Vegas and Los Angeles. "It took millions of years to form the vast delta region of the Río Colorado, but only 50 years to destroy," said Ernesto Reynoso of the Mexican group Centro Regional de Estudios Ambientales y Socioeconomicos, which participated in the tour. The Colorado River basin contains more than 40 dams and diversions.

In Japan, activists organized a celebration of the river and its animal inhabitants for the Day of Action. The Sagami River Camp-in Symposium organized a kayak trip down the Sagami River and conducted a survey of insects around the Sagami-ozeki Dam. Insect life in and around the river is a primary indicator of river health. Before the dam, over 60

continued opposite



Photo: MAB

Dam-affected rural residents marched outside government offices to protest eight proposed dams. This was one of a series of actions coordinated by Brazil's Movement of Dam-Affected People (MAB).

New Report on Ilisu Dam Reveals Major Problems

by Nick Hildyard

A major new report on the Ilisu Dam in Turkey reveals that precautions being taken by potential funders of the dam are not likely to prevent the project from becoming a social and environmental disaster. The report was produced by The Corner House, The Kurdish Human Rights Project, Campaign An Eye on SACE, WEED, Pacific Environment and the Ilisu Dam Campaign.

Few proposed infrastructure development projects have caused as much international controversy in recent years as the proposed Ilisu Dam in the Kurdish region of Southeast Turkey. Scheduled for construction on the Tigris River, some 65 kilometres from the Syrian border, the dam is intended to generate 3,600 gigawatt-hours of peak-hour electricity a year and is Turkey's largest planned hydroelectric project. The dam forms part of the giant Southeastern Anatolia Project (known as GAP), which includes a proposed network of 22 dams and 19 power plants. It would be built by a consortium of European and US companies for the Turkish government's State Hydraulics Works Department (DSI).

Financial backing is being sought from the export credit agencies (ECAs) of the companies' respective national governments, with Britain, Switzerland and the USA signalling provisional approval. Once constructed, the \$2 billion dam would be transferred from DSI to the state electricity company, which would then be responsible for its operation.

Lack of Information

As planned, the dam would submerge or partially submerge some 183 villages and the ancient town of Hasankeyf, a site of international archaeological significance. Yet, at the time that the project was provisionally approved by supporting ECAs, no resettlement plan had been drawn up for the estimated 78,000 people, mainly ethnic Kurds, who will

be potentially affected by the dam. Nor had there been any consultation with affected people or their elected representatives.

The dam's environmental impacts were also largely unassessed: although the companies seeking contracts for the dam had commissioned an Environmental Impact Assessment, independent reviews revealed it to be wholly inadequate. Moreover, despite fears that the dam could adversely affect the water quality of the River Tigris, disrupt downstream wetlands and irrigated agriculture, and exacerbate the potential for regional water conflict between Turkey and its neighbors, Syria and Iraq, there had been no consultation with downstream states, as required under international law.

Conditions of Approval

In response to growing pressure from the public, NGOs and parliamentarians, the ECAs have attached four conditions to their support for the project which the Turkish government must meet before export credits are issued. The conditions include:

- Draw up a resettlement program which reflects internationally accepted practice and includes independent monitoring;
- Make provision for upstream water treatment plants capable of ensuring that water quality is maintained;
- Give assurances that adequate downstream flows will be maintained at all times;
- Produce a plan to preserve as much of the archaeological heritage of the ancient town of Hasankeyf as possible.

The NGO report, which follows an October 2000 fact-finding mission to the region, concludes that the four conditions have yet to be met and that the prospects that they will be met in the future is remote. While the social, political and economic rights of the Kurdish majority in the region remain unrecognized – and indeed repressed – there

can be no confidence that the Turkish authorities will abide by the conditions. Serious concerns also exist over the capacity and will of the ECAs themselves to monitor and ensure compliance.

Even if met, says the report, the four conditions leave many key concerns (particularly those relating to transparency and human rights) unaddressed and would fail to bring the project up to evolving international best practice.

The report assesses the extent to which the project currently complies with the new guidelines for dam projects recently announced by the World Commission on Dams. It concludes that Ilisu violates every one of the WCD's major policy recommendations – and would do so even if the four conditions were fully met.

The report identifies a range of corporate governance failures in the practices and procedures of the supporting ECAs that have contributed to the controversy over the dam. In particular, the lack of common mandatory standards have encouraged a "ad hoc" approach to project financing that works to the detriment of affected communities and industry alike.

The report also considers the implications of the projects for the new environmental and human rights procedures that have been adopted by a number of participating ECAs, notably Britain's Export Credit Guarantees Department and Germany's Hermes. It argues that continued support for Ilisu would be in breach of both the spirit and letter of the new procedures and would signal "a fatal lack of purpose in reforming" the supporting ECAs. ■

The full text of the report is available by email from The Corner House (cornerhouse@gn.apc.org). Hard copies of the report 115 pp) are available for £5 (pounds sterling) from The Kurdish Human Rights Project (khrp@khrp.demon.co.uk)

Day of Action continued from page 6

kinds of endangered insects were found in the river corridor, and over 10,000 individual species of aquatic insects were found in the river. But activists say there has been only "the world of death" since the dam gates closed in 1998. They are now demanding that the gates be opened to let the river run.

In Guatemala, a new association of dam-affected people displaced by the Chixoy

Dam met with representatives from the World Bank on March 14, calling for the Bank to pay reparations for the massacre of nearly 500 dam-affected people almost 20 years ago.

A victory was celebrated in Thailand where hundreds of people rallied on the recently recovered banks of the Mun River. Last summer protesters pressured the Thai

government to open the Rasi Salai dam gates for two years. Now Mun River communities are celebrating the temporarily restored river but continue to fight for the permanent decommissioning of the Pak Mun Dam (see cover story). ■

For descriptions and photographs of actions visit: <http://www.irn.org/dayofaction>

It seems difficult for many people to accept that the seemingly serene surface of a reservoir could be belching forth as much heat-trapping gas as a smokestack. Even the UN's climate science panels have ignored the phenomenon. Measurements of methane and carbon dioxide emissions due to rotting organic matter in reservoirs date back only to 1993, and only some 30 reservoirs, mostly in Brazil and Canada, have been studied for their emissions.

The small cadre of scientists researching reservoir greenhouse gas emissions is deeply split. One group, largely funded by Canada's Hydro-Quebec and Brazilian hydropower interests, asserts that reservoir emissions are far lower than emissions from equivalent fossil fuel plants. Other scientists who are affiliated with various universities and research institutes, mostly in Canada, Brazil and France, warn that reservoir emissions are much more significant than commonly assumed and that in the tropics they can exceed emissions from fossil fuel-fired power plants. In order to try and reach some consensus, the World Commission on Dams (WCD) brought together 17 of the leading researchers on reservoir emissions for a 1999 workshop hosted by Hydro-Quebec in Montreal. The participants agreed on a statement that provides an important summary of the current state of knowledge on the subject. The following paragraphs in italics are taken from the Montreal statement.

Greenhouse gases are emitted for decades from all dam reservoirs in the boreal and tropic regions for which measurements have been made. Emissions result not only from vegetation and soils flooded by the reservoir, but also from the decomposition of aquatic plants and algae, and from organic matter washed into the reservoir from upstream. Reservoir emissions should be considered in assessments of individual dams and in global inventories of the sources and sinks for greenhouse gases.

Until the last few years researchers had presumed that emissions from reservoirs would spike immediately after reservoir filling and then quite quickly decline to insignificant levels as the flooded biomass decomposed. However, recent research has shown that while there may be an initial pulse of gases (especially for tropical reservoirs), emissions tend to decline over time only very slowly, if at all. The reason is mainly that methane and carbon dioxide (CO_2) are continuously produced from rotting plants and algae that have grown in the reservoir or been washed in from its catchment.

The realization that reservoirs may be a significant source of greenhouse gases has major implications for national and global

Neither Clean Nor Green

inventories of greenhouse gas emissions, which themselves have major implications in decisions on the most effective measures for reducing global warming. A paper published in 2000 by a team of Canadian researchers estimates that reservoir emissions contribute 7% of the total global warming impact of conventionally accounted-for human-related releases of carbon dioxide and methane. This paper uses an estimate of 1.5 million square kilometres for the global surface area of reservoirs of all sizes.

Methane and carbon dioxide are emitted from water passing through the turbines, over the spillway and downstream of the dam. These emissions may be significant ... Until recently researchers had only accounted for emissions from the reservoir itself. These are emitted by diffusion into the atmosphere from the reservoir surface and from bubbles rising from shallow reservoir zones. It is now realised that huge amounts of gases can also be emitted when water is discharged from the reservoir. Methane emissions from the turbines and spillway at Tucuruí Dam in the Brazilian Amazon are estimated to be up to eight times higher than those released by bubbling and diffusion from the reservoir... Hydropower emissions should be evaluated on a net basis over the catchment in question – it is not the gross emissions from a reservoir which is most relevant, but the difference in emissions from the catchment before and after a dam is built.

Ecosystems are a complex and improperly understood mosaic of both sources and sinks of carbon dioxide and methane. Most forests act as sinks of both gases while natural lakes are sources of both. Northern peatlands are carbon dioxide sinks but important methane sources. Evaluating net rather than gross emissions can therefore either increase or decrease the estimated global warming contribution of the reservoir depending on the characteristics of the area flooded.

Methane (CH_4) is known to be a much more powerful greenhouse gas than carbon dioxide. But calculating exactly how much more a molecule of methane contributes to climate change than a molecule of carbon dioxide is fraught with difficulties. While methane is much shorter-lived in the atmosphere than carbon dioxide, each methane molecule is much more efficient at trapping

The Surprising Truth About Reservoirs and Climate Change

by Patrick McCully

heat. The methane multiplier commonly used is known as the 100-year Global Warming Potential (GWP) and represents the impact after 100 years of a one-time pulse into the atmosphere of a ton of methane compared to one of CO_2 . The UN's Intergovernmental Panel on Climate Change currently estimates methane's 100-year GWP as 21, meaning that a ton of methane in the atmosphere causes 21 times more warming than a ton of carbon dioxide.

If methane reservoir emissions were indeed a one-time event resulting from rotting biomass submerged when the reservoir was impounded, this "pulse" approach might be appropriate. However, because the emissions are continuous, a different methodology is required. Atmospheric chemist Stuart Gaffin of the US group Environmental Defense has developed a model for assessing the climate change impact of continuous emissions of methane compared to CO_2 . According to Gaffin's model, after 100 years the cumulative global warming effect of a constant methane emitter is some 39.4 times greater than that of a constant emitter of an equivalent quantity of CO_2 . Methane, especially in the tropics, is a significant part of the emissions from a reservoir (up to three quarters of the total greenhouse gas impact in the case of Tucuruí). Using a larger methane multiplier can therefore greatly increase estimates of the total global warming impact of a reservoir.

The range of factors influencing greenhouse gas emissions include the reservoir's depth,



shape and size, the climate of its surrounding region, its operating regime and water residence time, the size and nature of the watershed, and the nature of human activities around the reservoir and upstream.

The single most important determinant of reservoir emissions is climate: emissions from tropical reservoirs are far higher than those from reservoirs in boreal zones. Shallow reservoirs are also likely to have much higher emissions than deep ones. The contribution of a reservoir to climate change compared with other electricity sources will also depend on the amount of power it generates. A dam in the Amazon basin with a low installed generating capacity and a large

power generators in much of the world – emit around 430-635 g CO₂-equivalent/kWh (including the warming contribution of methane leaks from gas extraction and transmission), while windpower emits 7-40 (much of that from the manufacturing and installation processes).

These estimates suggest that the warming impact of a modern gas plant is between five and eight times more than that of a high-emitting boreal reservoir, but that a tropical reservoir can have a warming impact up to 66 times greater than that of a gas plant.

The final WCD report notes that all reservoirs which have been studied emit greenhouse gases and that “in some circumstances the gross emissions can be considerable and possibly greater than the thermal alternatives.” But the report does not say, as it should, that the evidence points to the climate impact of tropical hydropower often being far worse than the thermal alternative. The WCD report’s guidelines recommend that estimates of net reservoir emissions be included in dam feasibility studies and notes the need for more research into reservoir emissions, especially in temperate and semi-arid regions.

A major report on hydropower and the environment was released in May 2000 by a hydro advocacy group called the International Energy Agency Hydropower Agreement. The report claims that hydro projects should receive subsidized loans from aid agencies “as a pay-back of the global community for the protection of nature and the world climate.” It also states that there “is no doubt that Clean Development Mechanisms [sic] (CDM) will provide a stimulus for hydro.” The CDM is the North-South emissions trading mechanism proposed under the Kyoto Protocol. This report claims that hydropower emissions are 2-48 g CO₂/kWh – a gross underestimate which is several orders of magnitude less than emissions from tropical reservoirs.

A Changing Climate for Dams

Just as dams are changing the global climate, so changes in the global climate are impacting the workings of dams. Climate change is rendering obsolete one of the key assumptions used in dam planning and design – that the hydrological past is a reliable guide to the hydrological future. The 2001 assessment of the Intergovernmental Panel on Climate Change predicts that the planet will warm by 1.4-5.8 degrees Celsius by the end of this century. For every degree increase, global precipitation is likely to increase by 2-4%. The resulting changes in regional weather patterns will vary widely but there

is widespread agreement among researchers that in many parts of the world the frequency and severity of both floods and droughts will increase.

Most dam spillways are designed to pass the estimated maximum flood which could occur in a catchment. But these maximum flood estimates do not allow for a changing climate. If spillway capacity is exceeded, water may flow over the top of the dam – “overtopping” is the single most important reason for dam failures. The WCD report “Dams and Development” expresses concern over the adequacy of existing spillways given the likelihood of increased flood intensities, and the ability of flood control dams to perform as designed.

“Reservoir reliability” – the ability of a dam to meet its design objectives – will be affected both by changing patterns of river inflow and because hotter temperatures will increase reservoir evaporation. Hydropower generation, for example, could be seriously reduced by increased droughts and evaporation, although it would benefit from increased rainfall. The WCD final report recommends that planning and monitoring of dams should take into account the impact of potential climate changes on both dam safety and performance.

The impacts of climate change on water resources will vary widely between regions and over time, and are extremely difficult to predict. But this uncertainty is no reason for ignoring climate change, which has largely been the response of dam operators until now. The WCD’s thematic review on climate change and dams rightly states that the best way for water planners to deal with uncertainty will be to reduce vulnerability through reducing water demand, rather than attempting to increase supply. Even without climate change, this is a common sense approach, but one which dam proponents have resisted.

Some in the dam industry have expressed outrage over the WCD’s conclusions on the contribution of reservoirs to climate change. The reaction is hardly surprising, given the high stakes for this dinosaur of an industry – it sees climate change as its last, best hope for justifying big subsidies for dams. But any further subsidies for dams are indefensible. Public funds for dealing with global warming should go to energy efficiency, sustainable energy sources like solar and wind, and other climate-friendly measures such as forest conservation and regeneration.

Dams won’t save us from climate change, and climate change will only further increase the risk of relying on dams for water management and energy supply. ■



Smokestack Photo: Werner Krutein / photovault.com

shallow reservoir may have emissions several hundred times higher per kilowatt-hour generated than a dam in Canada with a small deep reservoir and high generating capacity.

According to Éric Duchemin of the University of Quebec at Montreal, mean net emissions from boreal reservoirs are equivalent to 20 to 60 grams of CO₂ per kilowatt-hour generated. Net emissions from tropical reservoirs, according to Duchemin, range from 200 to 3,000 g/kWh. By comparison, natural gas-fired combined cycle plants – currently the technology of choice for

Amazon Basin Dam Would Be World's Largest "Run-of-River" Scheme

by Lúcio Flávio Pinto

The Xingu River is a major tributary of the Amazon. In 1989, Kayapó Indians led the attack against plans by the Brazilian state utility, Eletronorte, to build a series of dams on the Xingu. Now Eletronorte says it has new plans to build a dam which would be the world's second largest (in installed capacity), and has a new engineering design which will minimize impacts. But past experience shows that Eletronorte can hardly be taken at its word. The dam will flood the reserve of the Juruna Indians, and part of the city of Altamira, and will only generate at full capacity for half the year.

In March, José Antônio Muniz Lopes, the president of the regional electricity company Eletronorte, met with the Pará State Legislature in Belém to trumpet Eletronorte's new engineering design for the Belo Monte Dam. His presentation of the huge project, which with 11,000 MW of installed capacity would cost US\$6.5 billion – \$3.8 billion for the construction of the dam itself, and \$2.7 billion to build 3,200 km (2,000 miles) of transmission lines to reach São Paulo – seemed to win the hearts and minds of the parliamentarians, who are eager for development in Eastern Amazonian State. The electricity generated by Belo Monte would arrive at its final destination, on the other side of Brazil, at a cost of \$27.30 per kilowatt hour (kWh), considered cheap by Brazilian standards. The presentation was by every measure a striking public relations success.

Muniz Lopes told his absorbed listeners that one day, an Eletronorte engineer visiting the region of the Big Bend of the Xingu River realized that before the river makes an "S curve" between Altamira and Belo Monte, it forms two natural channels. Why not dredge and straighten them, then reinforce the channels with concrete to bring water from the reservoir to the dam's powerhouse?

This would allow a hydropower project that would not require flooding the entire area of the big bend. Instead of a 1,200-square-kilometer reservoir, the dam would need only one-third of that, 400 sq. km. – an area which is naturally submerged during the Xingu's high-water period. According to project proponents, nature would be preserved, an ecological reserve could be created on the islands of the big bend, and tourism – and all of us – would be winners.

But will Belo Monte really be the engineering marvel that Eletronorte claims?

At the risk of being stoned by those who support any proposal capable of bringing investment into the region, even if only the crumbs of the banquet will reach the greater population and even if the project's benefits will be outweighed by its costs, the Belo Monte project is an anachronism, proof that Eletronorte has not kept up with the political evolution of society in Brazil and in the Amazon region.

The studies and their resulting environmental impact report are due to be completed in a few months. The concession for the project will be offered at the end of this year, or at the beginning of 2002. With a national electricity crisis caused by insufficient water in the country's hydro-reservoirs, Eletronorte is rushing to get the project approved, and then it plans to turn everything over to private investors.

In reality, Eletronorte does not even have the money to carry out the necessary project studies. In 1999, it lost more than \$400 million. Last year's still-unreleased figures should show a loss of some \$600 million. Eletrobrás, the national electric authority, has so far fronted the money for Belo Monte.

If public funds are so scarce, and if construction and operation of Belo Monte Dam will be done by private companies, why is Eletronorte drawing up the basic plans for the dam, both in the areas of generation and transmission, and why is it rushing to complete an Environmental Impact Assessment (EIA)? Fadesp, the research foundation of Brazil's Federal University of Pará, has been contracted by Eletronorte to do the project EIA – without competitive bidding. Fadesp had a disastrous role in preparing the EIA for the Araguaia-Tocantins industrial waterway project in 1996. The EIA was rejected by environmental authorities due to its total failure to address critical issues surrounding this "hidrovia" project.

Is Fadesp now prepared for the challenge of translating the complexity of this project into a meaningful public document? Will it be able to maintain its scientific autonomy, without becoming captive to the gilded handcuffs and financial gag that its consultancy entails? Or will it end up serving the same controversial role that the National Institute for Amazon Research (INPA) served for Tucuruí Dam two decades ago – a rubber stamp of scientific approval for the project?

Misleading Assumptions

At the Belém meeting, Eletronorte's president said that Tucuruí dam cost \$4.7 billion. Eletronorte built Tucuruí, so one would think they would have a handle on its final costs. But their \$4.7 bn figure is far from the truth. The fact is that the World Commission on Dams (WCD) calculates the total cost of Tucuruí to be \$7.5 billion for the dam alone, with an additional \$1.27 bn for the transmission system, not including "longer-term interest payments." Based on WCD calculations of interest rates during the construction period, at least \$2.8 billion in interest would have been paid up to 2000. That would raise the total cost of the construction of Tucuruí (without the transmission system) to, conservatively, more than \$10 billion, more than double the figure Eletronorte uses. Including the transmission lines and interest paid on them, the total cost would reach \$13 billion. The disparity between Eletronorte's estimates on this project and reality certainly calls into question Eletronorte's cost estimates for Belo Monte.

Perhaps the most disturbing point made in Muniz Lopes' presentation is the revelation that Belo Monte dam will be virtually a run-of-river dam, with a minimal reservoir for water storage. To give an idea of the scale of this project, Tucuruí reservoir holds nearly 45 billion cubic meters of water, while Belo Monte reservoir will hold "only" 3.7 billion. Despite its run of river status, Belo Monte will permanently submerge the lowest parts of the city of Altamira. Unusual floods could raise the level of flooding by an additional two meters. Run of river dams depend on stream flow directly to the turbines, instead of stocking water in large reservoirs to guarantee available water power. In the case of Belo Monte, it now appears that Eletronorte is trying to sugar-coat a project which is technically inefficient and will end up being eco-

continued opposite



Photo: Monti Aguirre

Indigenous people from the Xingu River area have been fighting dams in their area for decades.

nomically unfeasible without upstream dams to regulate the flow of the Xingu.

For the dam's 20 turbines to achieve their maximum factory-designed output, they will need 14,000 cubic meters of water per second (700 m³ for each turbine). The flow of the Xingu varies between a maximum of little more than 30,000 m³/second down to a minimum of 443 m³/second. But the river has been known to have severe low-water periods lasting 2-3 months. During these periods, none of the dam's turbines will be able to function. For another three months of the year, only 2-4 turbines will work. That is to say, during as much as half the year, the flow of the Xingu is less than the 14,000 m³ necessary to maintain its nominal plant capacity. The firm potential of the dam thus drops from 11,000 MW to an average of only 4,700 MW, a plant factor of 43%, well

below the international standard of 50%.

The logical conclusion one can draw from this is that other dams will have to be built upstream of Belo Monte in order guarantee a controlled flow that is economically feasible (this situation already exists in respect to the second phase of Tucuruí, where its installed capacity of 4,200 MW falls off to 1,000 MW of firm energy generation during the low water season). The series of dams projected for the Xingu in the 1980s would have flooded many indigenous territories, including the Xingu Indigenous Park. Although Eletronorte has not mentioned reviving this entire scheme, given Belo Monte's poor performance during dry season, it seems likely that this project could involve multiple dams.

The fact that Eletronorte's president says that Belo Monte will be integrated into the national power grid means that its low pro-

duction during dry months will be compensated for by concurrent higher-water cycles in southern Brazil. But why then does Eletronorte want to spend a fortune to build a dam in the Amazon basin, which has 20% of the world's surface freshwater, when the project will have to depend on the critically over-dammed rivers of southern Brazil for its feasibility?

Many other questions can be raised. Incredibly, Eletronorte has said nothing until now regarding the downstream impacts of the dam. At its mouth, less than 300 km downstream, the Xingu forms a delta, an exceptional phenomenon for an interior river. What will be the effect of this engineering scheme on the river's ecosystems? It is likely to create moments of exceptionally intense as well as exceptionally weak flows, compared with the natural flow of the river.

Eletronorte's record in constructing the Tucuruí, Balbina, and Samuel dams shows it cannot really be trusted to maintain high technical, social, and environmental standards – particularly for such a enormous project, which will have little relevance for the long-term needs of the populations of the region. Brazilians will have to keep both eyes on Eletronorte to make sure that Belo Monte receives close scrutiny before it is permitted to move ahead. ■

The author (jornal@amazon.com.br), a native of Pará state, writes and publishes the newsletter Amazon Agenda, where this article was originally published.

Yacyretá Dam Damaging Wetlands

by Glenn Switkes

Despite mounting evidence that the Yacyretá Dam (in Paraguay and Argentina) is having serious impacts on nearby wetlands, project authorities are increasingly dismissive of scientific studies that come to this conclusion, and continue to press for the raising of the reservoir to maximize the dam's income.

In August, 2000, the Yacyretá Binational Entity (EBY) convened an Experts' Panel to assess whether, and to what degree, groundwater infiltration from the Yacyretá Dam reservoir may be affecting the Iberá wetlands and surrounding grasslands. The level of water in the wetlands has risen considerably in recent years. EBY had never carried out studies to assess the possibilities of such an occurrence and, in fact, environmental impact studies for the dam, which was fund-

ed by the World Bank and Inter-American Development Bank, were carried out only after construction was underway.

As early as 1992 (the floodgates were closed in 1994, when the reservoir was partially filled to the level it remains at today), consultants for EBY had warned the company regarding the lack of information available on the water table, and indicating the possibility that subterranean basalt formations were permeable. The panel told EBY, "... as the reservoir level is raised, underground water supplies will be more affected ... with the raising of the water table. This can cause salinization of soils, contamination of aquifers, and formation of swamps in lower zones, creating conditions for vectors which can impact public health. This can also modify the vegetation near the dam and the animals that live with it ... For

this reason, a study to evaluate this aspect would be important."

In 1997, the World Bank admitted that this problem would have to be dealt with before raising the reservoir to its design level. An Experts Panel was convened last year to analyze past studies which had been carried out by the C. Lotti consultancy (Italy) and Harza Engineering (US). Discrepancies between the findings of these two studies were cause for wildly varying assessments of the degree of seepage taking place.

The Panel's report found there was little or no seepage taking place, and the report only recommended the implementation of a monitoring program and further hydrological studies. At a technical meeting called by EBY to discuss the panel's report, José Angelari, a specialist in hydrogeology represent-

continued on page 14

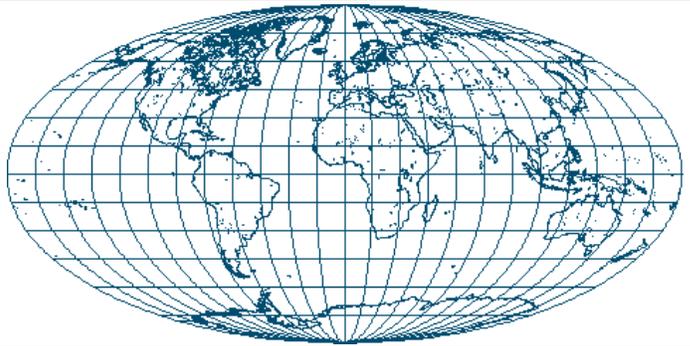
SHORTS

Brazil, more than 90% dependent on hydroelectricity for its energy, is facing its first energy rationing in 14 years, as a result of sparse summer rains. Reservoirs in the southeastern region which provides energy for São Paulo have dropped to 34% capacity – this at the end of the rainy season. The Brazilian electric sector has responded by asking domestic consumers to take fewer showers and turn off their lights, even though energy-intensive industries consume 40% of electricity. The Movement of Dam-Affected People has prepared a report showing that investments in energy efficiency, retrofitting old dams, small hydro and biomass could pull the country out of its energy doldrums.

China's largest city of Shanghai has vowed to raise its water-recycling rate to more than 80% by 2005, reports *The People's Daily*. According to a city official, Shanghai will limit the supply of water to those major enterprises that recycle less than 50% of water. More measures will be taken to reduce pollution in local rivers, the official said. A recent survey indicates that Shanghai produces 5.8 million cubic meters of wastewater daily, of which only 54% is treated. Nationwide, Chinese cities are facing mounting water supply shortages. Some 400 of China's 668 cities are facing water shortages, and of the 400, more than 100 are threatened with serious situations.

A US federal appeals court has overturned a ruling barring coal-mining companies from dumping mining debris into most streams and rivers. The ruling, based on who has jurisdiction over state mining rules, is a major setback for opponents of a technique known as mountaintop removal mining, which involves using explosives to shear off the tops of mountains to get at the underlying coal. Mining wastes are then bulldozed into surrounding valleys and streams. The overturned ruling was put in place in 1999, after residents living near coal mines sued the state for not enforcing mining regulations that require a 100 foot buffer zone between mining activities and streams. Citizens groups said the case would be appealed to the US Supreme Court.

News Briefs



DAM UPDATES

PORTUGAL: More than a million cork oaks and olive trees, including ancient old-growth trees, are being cut down to make way for Europe's largest reservoir. The huge logging operation began in March in preparation for construction on the Alqueva Dam on the Guadiana River in southern Portugal. Clearing the land is expected to take a year, according to EDIA, the publicly funded company overseeing the project.

The logging is just one of the project's many environmental and social impacts. The deforestation causes an irreversible loss of habitat for several endangered species, including the Iberian lynx and the golden eagle. There will be social disruption as local people are displaced and an entire village submerged. The project is being built on an active fault line, raising safety concerns.

The reservoir will also submerge several archaeological sites dating to the Neolithic period. Archaeologists, who say the findings could date back as far as 20,000 years and are considered one of the most important archaeological discoveries in recent times, have called for work on the dam to be suspended pending a truly independent international commission to study the engravings.

But in early May, the dam hit a legal snag as European Commissioners began to investigate alleged financial mismanagement on the project. The European Union is paying for more than half the project's US\$407 million cost. The group SOS LYNX filed official complaints with the European Commission demanding that work be suspended. It also demanded an investigation by the Commission to determine why the project's environmental impact assessment failed to show how the project would affect the Iberian lynx, which the European Union lists as a priority protected species. European Union laws prohibit development in areas which can interfere with lynx habitats.

The Portuguese government says the dam will provide hydropower, irrigation and jobs (partly through building golf courses for tourists). The economic benefits of the proj-

ect are highly questionable because the European Union's new full cost recovery principle will render the irrigation projects of the Alqueva Dam unprofitable.

The Portuguese environmental group Quercus says the government's projections for water demand are overstated, and is urging the government to reduce the project dam height to reduce inundation area and save 400,000 trees. Quercus spokesman Jose Paulo Martins called the dam "a deliberate, planned disaster."

Visit this Portuguese-language site for more information: <http://www.lpn.pt/>

GHANA: In late April, a British scientist was banned from conducting research in Bui National Park in Ghana, which is due to be flooded by a hydroelectric dam on the Black Volta River. University of Aberdeen zoologist Daniel Bennett says he is the only living scientist to have conducted biological research in the 1,800 square kilometer (700 square mile) reserve, which he says contains, "the last pristine wilderness in the entire Volta System."

Upon arriving in Ghana recently, government wildlife officials told Bennett that the Bui area is now politically sensitive and that his studies are no longer in the national interest. His permission to conduct the research has been withdrawn and he was discouraged from visiting the park and surrounding area.

"The intention seems to be to ensure that nothing challenges the results of the recently commissioned environmental impact assessment of the Bui Dam Project, to be conducted by a Canadian company Acres under contract from the Volta River Authority," Bennett said.

Bui park is home to the largest of two groups of hippos left in Ghana, which now has only 400 hippos nationwide. Bennett, who has been researching the area for seven years, claims the dam will destroy all the feeding grounds of the hippos.

The villages that are condemned by the dam have requested that Bennett maintain his interest in the area. "They report that they have never been consulted about the

dam and the effect it will have on their lives," Bennett said.

The \$900 million hydroelectric project is scheduled to start producing power in 2006. The dam will be built by a consortium led by Brown and Root of the UK. Construction is due to begin in 2002. The 660-square-kilometer (255 square mile) reservoir will flood all of the park's riverine forest. The government claims that animals from Bui will be relocated to a hippo sanctuary, but Bennett is skeptical. "Hippos are very big and extremely dangerous. Catching 400 hippos would be impossible. It would be carnage."

For more information see:
<http://hippo.50megs.com>

BRAZIL: Irregularities in environmental studies place doubt on Brazilian dam project. A public hearing held in Paraná state in March cast doubt on the validity of the Environmental Impact Study for a dam proposed on the Tibagi River. The authors of the study admitted that their report was "incomplete, superficial, and with errors." Three communities of Guaraní and Kaingang indigenous peoples will be affected by the São Jerônimo Dam project. Initially, the indigenous tribes opposed the dams, but now that they have been offered land four times the area which will be flooded, construction of brick houses, a \$450 stipend for each member of the community, education, health and day care facilities, plus a 1% royalty on electricity sales, a majority recently approved the project in a plebiscite.

Despite irregularities in the studies which are still being analyzed by environmental authorities, and the fact that Constitutional guarantees require a special act of the national Congress to approve any project affecting indigenous peoples, the National Agency for Electrical Energy (ANEEL) has placed the 331 MW São Jerônimo dam on its list of eight projects which will be offered for private concession in June. São Jerônimo is the first of a series of four dams planned for the Tibagi, although ANEEL insists the other three projects have been shelved. Opponents say this is just a ploy to get São Jerônimo approved.

THE BUSH WAY

ENERGY: The Bush administration, whose energy policy appears to have been written by the oil and coal industries, announced in early April that it would pass a weakened version of new energy efficiency standards for residential air conditioners and heat pumps, first proposed by the Clinton administration. The American Council for an Energy Efficient Economy (ACEEE) called the administration's decision "stunningly shortsighted." Energy

Secretary Spencer Abraham said the Bush administration decided the standard proposed by the Clinton administration in January, which would have boosted the efficiency of both air conditioners and heat pumps by 30 percent, would prove too costly. The Clinton standard would have saved about 4.2 quads of energy – enough to light all US homes for 3.3 years – by the year 2030, while boosting the average price of the appliances by \$335. The Bush standard is projected to save about three quads – the amount of electricity required to light all US homes for more than two years – by 2030, while increasing appliance prices by \$213. ACEEE said, "This decision represents a triumph of ideology over common sense. A leader that turns away from cost effective opportunities to reduce the demand for energy cannot expect to marshal public support for costly and environmentally damaging measures to increase energy supplies."

Overall, the Bush team's proposed 2002 budget for the Department of Energy would slash funding for energy efficiency research and development by \$180 million, or 29 percent.

FLOODS: As parts of the Upper Midwest endured a fourth 100-year flood since 1993, several federal programs that help reduce the damage caused by catastrophic floods face massive cuts in the Bush Administration budget.

The Bush budget requests no funds for the Army Corps of Engineers' Challenge 21 program, which helps local communities relocate vulnerable residents and restore floodplain and wetland habitat. The Administration proposes to cut all funding for the Wetlands Reserve Program, a voluntary program that compensates farmers for restoring wetlands on their land. A single acre of wetlands can absorb up to 1.5 million gallons of water. More than 190,000 acres have been enrolled in the five states of the upper Mississippi River, and farmers are waiting to enroll an additional 130,000. The budget would cut the federal match for voluntary buyouts and relocations from flood prone areas through FEMA's Hazard Mitigation Grants Program by 25%.

"Natural rivers have many benefits for people, but sometimes, they can damage people's property as well," said Rebecca Wodder of the Washington, DC-based American Rivers. "Unfortunately, efforts to control them through dikes, levees, pumps, and other structures have often aggravated the damage from floods, which are natural and inevitable. Federal and local governments should be restoring floodplains and wetlands

to reduce flooding, while protecting residents and businesses by helping them move out of harm's way."

A BETTER WAY

UK: Britain cleared the way on in early April for a \$2.3 billion investment in offshore wind power, the largest scale renewable energy project in the UK. In all, 540 high-tech windmills producing three megawatts of power each, will be installed between 1.5 and 10 kilometers offshore. The projects are expected to supply one percent of Britain's energy needs by 2004-2005, and are part of a government plan to get 10 percent of the UK's energy from renewable sources by 2010. The seabed leases are expected to go to 18 companies at 13 sites, which will produce between 1,000 and 1,500 megawatts of power altogether.

Offshore wind is more expensive to tap than onshore, but local resistance to noise and to the sight of tall land-based turbines has made it an option worth exploring. According to the British Wind Energy Association (BWEA), Britain's ocean winds could supply three times the island's electricity needs, and could easily be producing 10 percent of its electricity by 2010. It says wind power onshore and offshore is already price-competitive with natural gas. "We don't need subsidies any more," said a spokeswoman for the BWEA.

Companies involved in the projects still have to obtain planning permission from the government within three years or lose their lease. But the UK Department of Trade and Industry aims to set up a "one-stop shop" to expedite the permit process.

EUROPE: Fuel cell buses will be delivered to nine European cities for use in transit service beginning in 2002. The European Union is providing partial funding for the buses. The new buses had undergone field trials in Chicago, Vancouver and Palm Springs in the US.

A fuel cell combines hydrogen with oxygen to produce electricity, heat and water. Because the only emission from fuel cell vehicles fueled with hydrogen is water vapor, they are significantly cleaner than existing internal combustion vehicles. The cities getting the buses are London, Reykjavik, Stockholm, Amsterdam, Luxembourg, Hamburg, Stuttgart, Barcelona and Porto. The buses are being supplied by EvoBus, a division of Daimler Chrysler. The vehicles will be fueled with compressed hydrogen, and will have an operating range of about 150 miles. The buses will have their own dedicated hydrogen refuelling facilities.

Pak Mun continued from page 1

struction on Hua Na Dam in Si Sa Ket Province, and has established joint committees to consider complaints on other dams.

Ms. Wanida Tantiwittayapitak, Advisor to Assembly of the Poor, said the warm treatment that the villagers had received from the Thaksin Shinawatra government was in stark contrast to the cold-shoulder given by the Chuan Leekpai administration. Last year,

after a series of protests on the dam, the Chuan government opened the dam gates for two months during the rainy season, but made no commitment for the future.

Chuan's main concession to Assembly of the Poor was an order to open the gates at Rasi Salai, a dam further upstream of Pak Mun. The gates have been opened since last July and studies are currently being conduct-

ed which will determine whether the gates will be permanently opened. The villagers at Rasi Salai have already witnessed a dramatic increase in fisheries since the dam gates were opened. They are able to harvest foods such as mushrooms, vegetables and herbs from the former reservoir, and some are preparing their formerly flooded lands for cultivation of cash crops and vegetables. ■

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ing the Corrientes Water Institute (Argentina) and a resident of the region affected by the seepage, said that the consultants on the Lotti study admitted that their computer model was based on unreliable data, and that Harza carried out its study using projected data. Independent analysis of the experts panel report show that both studies guessed at key data such as where the seepage is taking place, the width and depth of the infiltration, water flows, and other data which provided the parameters for the computer modeling used by the panel.

The proposal for long-term monitoring of the reservoir's effects on the wetlands is an important one, but the information will come too late to mitigate the impacts from

the planned raising of the reservoir's level later this year.

Last October the Argentine Subsecretariat for Environmental Policy organized a workshop on the environmental impacts of the dam on the Iberá wetlands, with the participation of various experts from Argentina and the US. EBY did not send a representative to this event, and surprisingly its executive director told the government that it had "closed its discussion on seepage from the Iberá system," contrary to the recommendations of the Experts Panel to broaden its research on this theme.

The government seminar conclude: "There is evidence of multiple alterations in the ecosystem, caused by the raising of the

hydrometric level in the wetlands, which is causing damage to diverse components of the environment such as plant and animal life, diminishing habitats for marsh deer, birds, and reptiles, and affecting productive activities such as rice farming, forestry, cattle ranching, and tourism."

According to Argentine geologist Adolfo Fulquet, who has been studying the Iberá seepage, "there may be good arguments to maximize the income from the 20 turbines that are already installed. Nevertheless, it is essential to carry out the necessary studies so that more serious environmental damages may be avoided. EBY must determine, through careful studies, if there is seepage, and what is its source and magnitude." ■

Lesotho continued from page 5

tant generator of local employment within the project watershed," the RDAP budgeted almost \$1.5 million to promote the establishment of adventure resorts and lodges throughout the catchment. The largest of the lodges is proposed to accommodate 250 visitors, and is to offer activities like scuba diving(!) in the virtually lifeless reservoir, boardsailing, hot-air ballooning and mountaineering. Promoting eco-tourism at an unnatural lake which dispossessed thousands of their livelihoods and left downstream river reaches with 5 percent of their normal flow rate is unseemly, and the short-sightedness of promoting ballooning in a heavily mountainous area with high winds and few roads is unbelievable. A recent video commissioned by the LHDA and the Lesotho Tourist Board promoted the ridiculous notion of a "magnificent 18 hole golf course in spectacular settings" around Mohale Dam. The construction of such a facility would involve enormous cost, use tremendous amounts of water and inputs, and would appropriate further tracts of land, increasing stress on already over-stretched resources.

Other Mohale development programs also struggled. LHDA failed to establish a credit facility for affected people despite hav-

ing conducted several years of negotiations between the project and financial institutions and after promising credit to a group of affected people. The lack of such a facility contributed to affected people's continuing dependence on compensation payments. Training programs for village leaders concerning the design of development plans also fell severely behind schedule in part because of a lack of funding. Promises to build extra classroom space and community facilities have gone unfulfilled to date.

The RDAP's training programs, like those of the RDC before it, have not produced much in the way of entrepreneurship or other income generating activities. "Development Teams" were to help affected communities set up small businesses, but the teams have yet to materialize. In fairness, it is still relatively early in the project cycle, but most of these programs were slated to be fully implemented by 2003.

One of the most troubling indicators of the RDAP's ineffectiveness is that water supply systems have still not been installed at some of the Mohale resettlement sites. People who were resettled to the foothill village of Makotoko still do not have the promised water taps on their plots, so they must get

water from distant streams. LHDA also failed to install water taps in the urban resettlement site of Makhoakhoeng for over a year. During that time, the resettlers collected water from large tanks that LHDA periodically delivered to the site. The Water and Sewerage Authority (WASA) connected the village to its distribution network in 1999. This soon became an unexpected hardship. For several months after WASA installed the taps, the people of Makhoakhoeng were not billed for the service. Then, in late 1999, they received bills for their water usage that month and for the months that they had not been billed previously. Some of these bills were for \$30-60 – a huge cost for resettlers who previously collected water at no cost. Some households receive only \$130/year in compensation. "LHDA said we have to bear the cost of the water," said one resettler, "but we don't have money." Some 550 people will be forced to relocate to sites without water supply systems in 2001.

LHDA declares that the RDAP's "ultimate goal is for communities to take direct responsibility for the development process." This is no simple task. Affected communities have been and continue to be much more

continued opposite

Western River Restoration Plans Dimmed by Energy Crunch, Drought

by Elizabeth Brink

Drought in the Pacific Northwest and an unreliable energy supply in California are conspiring against efforts to restore the state's rivers. The California power crisis – really more an issue of policy errors and market manipulation than a shortage of megawatts – is being used as justification for dismantling efforts to protect or restore the West's rivers.

A range of river-damaging proposals are being floated. There have been calls to construct more hydro dams, generate more power from existing facilities by diverting more water, and relieve hydro dam operators from the legal obligation to meet minimum flows to maintain fisheries and other natural values. The entire federal dam relicensing process is in limbo. The multi-billion-dollar Auburn Dam (proposed for the American River) is rearing its ugly head again. The Association of California Water Agencies asked a congressional panel for billions of dollars in early April to help fund more state water reservoirs. Courts are determining the allocation of scarce water resources between conflicting demands of farmers, energy consumers and the health of the environment. Federal hydropower managers in the Pacific Northwest recently reduced the flow of water from the Grand Coulee Dam on the Columbia River, which will eliminate many shallow pools used for nesting by threatened chum salmon.

Here are details on two critical river-restoration efforts that are facing new obstacles this year.

Trinity River

Currently, 75 percent of the Trinity River's water – some 300 billion gallons a year – is diverted to the semiarid central San Joaquin Valley to irrigate crops and provide water to

residents and businesses. In one of his last acts in office, former US Secretary of the Interior Bruce Babbitt formally announced in December 2000 a new flow regime for the river that could, if implemented, offer some chance of restoring its salmon runs. The plan would allow no more than 53% of the Trinity's water to be diverted to irrigation projects in the Central Valley.

Numerous obstacles are lining up against the decision, however, including a lawsuit, second-guessing by the new Bush administration, and regional drought. A federal judge ordered a one-year delay and a "supplemental" study of the effects on hydroelectric generation of the plan to restore water to the river. For the coming year, the judge permitted the river to get only a quarter of the amount of water it would receive in a normal year.

Klamath River

Embattled salmon were handed a water victory in the drought-stricken Pacific Northwest on April 4 when a federal court judge ruled that the US Bureau of Reclamation cannot deliver water for agricultural irrigation without considering the needs of coho salmon in the Klamath River.

The Klamath Project intercepts key rivers and streams that flow into and out of Klamath Lake and diverts them to irrigators. More than 75% of the area's wetlands have been lost to agriculture because of the project. Almost 7,000 fishing-dependent jobs, valued at \$137 million per year, have been lost due to harm done to Klamath River salmon, according to Jan Hasselman, an attorney for Earthjustice Legal Defense Fund, which represented a coalition of fishing and conservation groups in the lawsuit.

"The law is crystal clear that the bureau must consider the needs of the salmon and

other wildlife species before devoting the lion's share of the basin's scarce water to other uses," said Hasselman. "The days of putting irrigators ahead of all other interests in the basin are officially over."

Farmers in Southern Oregon's parched Klamath Basin immediately sought a court order forcing federal dam operators to send water to their fields.

Conservation and fishing groups are urging the Klamath Basin farmers to conserve water. "Many farms in the basin use water very inefficiently and wastefully. Others are economically very marginal," Hasselman said.

Taking Action

Many groups are now mobilizing to protect rivers from the twin threats of drought and the energy crisis, and trying to raise awareness that healthy rivers do not need to be sacrificed to keep the lights on. A few highlights:

- Friends of the River has numerous resources debunking the need for more dams and diversions on California rivers (see www.friendsoftheriver.org), and is stepping up its fight against the Auburn Dam.
- American Rivers (www.americanrivers.org) is campaigning against a newly introduced federal bill, the "Electricity Emergency Relief Act," which would weaken environmental regulations on federal dams, and is taking on the Bush administration's efforts to protect Snake River Dams.
- In early May, a broad coalition of groups – including National Wildlife Federation, Trout Unlimited, Earthjustice Legal Defense Fund, various fishing groups and others – sued to protect endangered fish species in the Columbia and Snake Rivers in the Pacific Northwest. ■

Lesotho continued from page 14

concerned with compensation than development. While this may be a frustration to LHDA and World Bank staff, it is the natural response to dispossession, especially among poor, risk-averse communities.

Even without affected communities' resistance, though, the prospects for restoring livelihoods in project areas through rural development programs are bleak. Programs

such as those described in the RDAP have failed repeatedly in Lesotho. As Ferguson noted in *The Anti-Politics Machine*, "if Lesotho is poor it is not because no one has ever tried such 'development' before." Decisions regarding future dams in Lesotho must be informed by the fact that they will inevitably leave many destitute. Development programs for displaced people, no mat-

ter how well intentioned or funded, may appease the consciences of project officials and funders, but will not satisfy the hunger of the dispossessed. ■

The author lived in Lesotho for three years, documenting the project's impacts on people in the rural mountain communities affected by the LHWP dams.