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Thai Villagers Refuse to Move as Dam Waters Rise

by Aviva Imhof



Photo: Searin

Villagers pray for the spirit of the river to protect them as the waters rise.

In early November, 400 villagers occupying the Rasi Salai reservoir in northeastern Thailand nearly drowned in their quest for reparations for dam-related losses. Drawing inspiration from the struggles in India's Narmada Valley, villagers have been occupying the reservoir since August 4 and refuse to leave until their demands have been met.

On November 6, 30 shelters were submerged by the rising waters. The villagers crowded into eight houses that stood on higher ground, with more than 25 people in each house. The houses were isolated by the rising waters, and villagers lived in cramped conditions two kilometers from dry land. More than half of the food and belongings of the villagers were swept downstream.

Two weeks later, responding to domestic and international pressure, the Department of Energy Development and Promotion

***The Mun River, our mother,
has been chained
We are losing her because
of injustice
But still we stand up
Standing up in our fight
to free her.***

Prayer of Rasi Salai villagers

(DEDP) was directed by high-ranking officials in Bangkok to lower the height of the reservoir, reducing the immediate threat to villagers' lives. Yet since that time, the government has failed to respond to the sub-

stantive demands of the villagers. Village leader Pijit Silalak said, "We will stay here even if we must drown. This seems to be the last choice of those who have been fighting for their rights for more than six years."

The villagers are demanding that the government reexamine the impacts of the project, drain the reservoir, determine the exact number of people affected by the dam, pay compensation to all affected peoples, and correct the environmental problems caused by the dam. If the government refuses to do these things, the villagers demand that the dam be removed.

The irrigation dam was completed in 1994, and is part of the Kong-Chi Mun Water Diversion Project, the largest of its kind in northeastern Thailand. Under the ambitious plan, the DEDP aims to build 13 dams on the Chi and Mun rivers over the next 40 years, and divert water from the Mekong to irrigate the northeast. Rasi Salai is the first dam in this plan, and is currently useless as the irrigation canals essential to the project have not yet been completed.

The project has been plagued by controversy. Construction commenced in secrecy, without any disclosure of information to potentially affected people. The DEDP refused to conduct an environmental impact assessment, claiming the project involved a rubber weir only 4.5 meters in height and that no land would be flooded. In reality, the DEDP built a 9-meter-high concrete dam, and more than 100 square kilometers of freshwater swamp forest and other lands were inundated. By law, an EIA is required for all dam projects which have a reservoir greater than 15 square kilometers.

The dam destroyed the largest freshwater swamp forest in the Mun River basin. This rare ecosystem was an extremely important fish habitat, and provided many essential items for villagers, such as honey, vegetables,

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Everyone agrees that China needs clean energy options. In the past two decades, pollution from coal fired plants has blackened China's skies, caused health and environmental crises and contributed to global warming. Sulfur dioxide and soot from coal creates acid rain that falls on 30 percent of the country and has affected India, Japan and Southeast Asia. Of the ten most polluted cities in the world, seven are in China.

In response to this crisis, the government has been encouraging development and implementation of clean-air technologies and renewable energy sources. China's coal consumption in the past year decreased significantly as a direct result of market reforms, closing inefficient state-owned enterprises, and the implementation of energy efficiency programs. Many in the international community recognize this as an important opportunity to bolster China in its efforts to develop renewable energy sources. The US Department of Energy last month announced support for a US\$25 million program to develop wind and solar projects.

However, senior officials, international aid agencies and foreign engineering firms continue to push China toward large, expensive and inflexible hydropower projects. The recently completed Ertan Hydroelectric Project in Sichuan is the perfect example of how this approach can create more problems than it solves (see opposite page). Ertan was made possible by the World Bank's largest-ever financing package for a single project. World Bank staff described the objectives of the project to be "alleviation of acute power shortages in a least-cost manner." The outcome, however, has proven to be quite different than planners had hoped. In the midst of an electricity glut, Ertan Dam doesn't have buyers for about half of its electricity and is expected to lose up to \$120 million this year. Consumers are not likely to buy Ertan's electricity as long as there are cheaper alternatives available.

Dams in China have been a disastrous experiment from all angles. Its nearly 19,000 large dams have displaced well over 10 million people, irreparably damaged aquatic ecosystems, and caused serious safety problems. A 1975 series of dam collapses in Henan province caused the deaths of over 230,000 people. Today, corruption and poor planning continue to result in dam-related safety hazards in China. Earlier this year, many bridges and related infrastructure for the huge Three Gorges Dam was labeled "tofu scum" by the nation's premier, and ordered ripped out and rebuilt.

Technically, dams on China's rivers face costly challenges as well. China's reservoirs have perhaps the world's highest average sedimentation rate (11.5 times faster than the average US sedimentation rate, and twice the world average). This rapid loss in reservoir capacity results in shorter lifespans for its dams, greatly reduced economic viability, and huge changes to floodplains downstream. In one case, the Yangouxia Dam on China's Yellow River lost almost one-third of its storage capacity before it was even commissioned in the 1950s.

Economically, China's hydropower cannot compete with other options, such as combined-cycle power plants, cogeneration plants or demand-management conservation measures. Large dams also have huge social and environmental costs compared to renewables such as solar and wind. China's geography and climate are well suited to both solar and wind power. Strong wind sources have been identified along its coasts, offshore islands and northern regions which are near major population centers. Wind speeds are suitable for both rural village electrification and for large scale grid-connected electrical generation.

All of these options – combined-cycle power plants, cogeneration, demand-management and efficiency measures, and renewables – are more flexible and, ultimately, more economical than expensive and slow-to-complete hydroelectric dam projects.

Rather than learning from the problems at Ertan, members of the "hydro-mafia" – in this case, the World Bank, powerful members of China's old political guard, and foreign engineering and construction firms – are advocating for more hydro development in the Yangzi watershed. Several projects are planned that will be larger and more expensive than Ertan.

The impacts of China's large dams will extend beyond the millions displaced from their homes and land, and the irreparable damage to rivers and watersheds. The economy and its electricity sector will suffer a blow as well. While technological advances from around the world offer the promise of cheaper, cleaner, and more reliable power, China's citizens are being encouraged to buy expensive and unreliable power from dinosaur projects such as Ertan and its ilk. It is time for an energy revolution for China, and a new ethic for those pushing such projects on the Chinese people.

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Ertan Dam's Power a Hard Sell

by Doris Shen

Ertan Dam, the largest hydroelectric project ever to be built in China and one of the largest dams in the world, is losing more than US\$2.4 million a day. It has been losing money since its turbines first started producing power in August 1998.

The \$3.4 billion dam, which garnered the World Bank's largest-ever project financing package (\$1.2 billion, according to the World Bank), has been running at half capacity since operation started. Losses are expected to grow after the last two of six turbines are installed, which will bring the total generating capacity to 3,300 megawatts (MW).

"The Sichuan provincial government has ordered only about half of our current generating capacity," the project site manager told the *Financial Times* in November. "We do not see the situation improving next year."

Sichuan, along with many other parts of China, has had an electricity surplus in recent years, a result of a steady slowdown in economic growth from 12.6 percent in 1994 to a predicted 7 percent this year.

Project planners have trumpeted Ertan's larger-than-life statistics. It has the world's longest diversion tunnels Asia's largest underground powerhouse, the second largest power station (after the Three Gorges Dam, under construction downstream), and the largest concrete arch dam in the world. A German contractor working on the project described the project's tunnels as "more like cathedrals." In this case, bigger does not mean better; it means inflexible.

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 which have sprung up since ground was first broken for Ertan in 1991. Like many huge hydroelectric dams, Ertan is hugely inflexible. In the two decades it took to plan and build Ertan, assumptions about power needs in China changed dramatically, and now it seems the dam may have been an expensive mistake.

It could have been worse. Developers had hoped to use power revenues from Ertan to finance the construction of another 20 large hydroelectric projects on the Yalong River – a tributary of the Yangzi. The cascade dam scheme could produce 22,500 megawatts of power.

Power Agreements Dropped

Knowing that cheaper power is available locally, Chongqing leaders have complained that the price of Ertan power, which is about six US cents per kilowatt-hour, is too high. The Ertan Corporation, meanwhile, has lost its monopoly status and cannot force consumers to buy power they do not want or need. "We have our own power stations to satisfy our needs and they are cheaper than Ertan. Why should we take that power?"

asked a Chongqing city official. Nouredine Berrah, World Bank task manager for Ertan, remarked in 1995 that the project

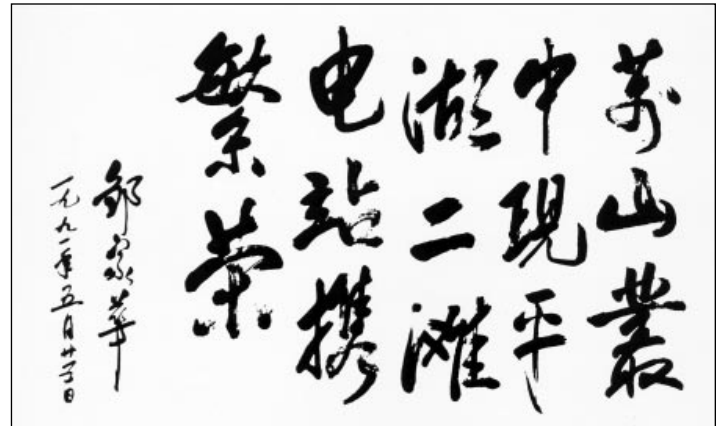
is "more than just building a dam and generating power. Increased power generation will be a stimulant for growth, changing the life of millions by giving them access to the basics we take for granted."

When questioned in late October about Ertan's energy surplus and lack of demand for its comparatively expensive energy, Berrah called the issue "complicated." He contends that project economics are not to blame, but rather that financing and contract laws in Sichuan are weak.

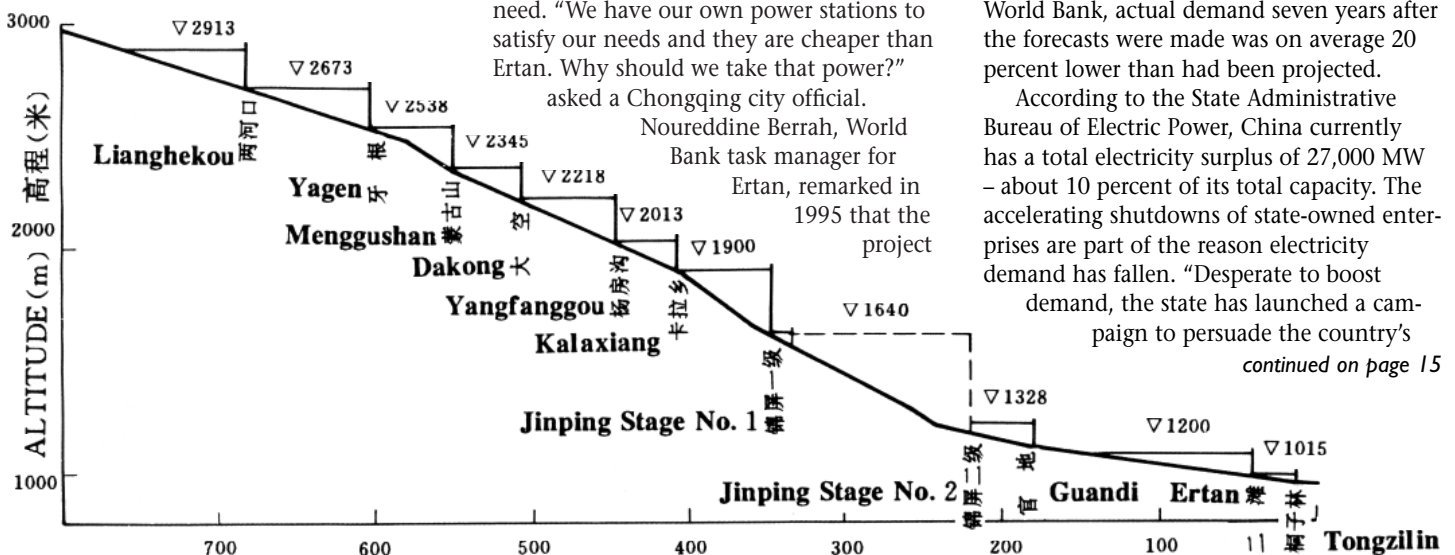
Ertan task managers at the World Bank contend that electricity will be "absorbed" by the China's growing economy and increasing demand for energy. However, the World Bank has overestimated energy demand forecasts in the past. In more than 100 national demand forecasts used by the World Bank, actual demand seven years after the forecasts were made was on average 20 percent lower than had been projected.

According to the State Administrative Bureau of Electric Power, China currently has a total electricity surplus of 27,000 MW – about 10 percent of its total capacity. The accelerating shutdowns of state-owned enterprises are part of the reason electricity demand has fallen. "Desperate to boost demand, the state has launched a campaign to persuade the country's

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"The smooth lake appears in the mountains, the Ertan hydroelectric project will bring about thrivingness." (from official project propaganda)



An engineer's vision for a cascade of dams on the Yalong River, including Ertan.

California to Decommission Five Dams

Battle Creek Restoration Called a Compromise

by Elizabeth Brink

A plan to remove five dams in an effort to restore 42 miles of Northern California's Battle Creek was unveiled this month by Bruce Babbitt, Secretary of the US Department of the Interior. The ambitious proposal, which also includes the construction of fish ladders and screens on dams to remain, represents an improvement for Battle Creek and the wildlife that depend upon it, but frustration for river conservation groups, and a possibly dangerous precedent for taxpayers.

Heralded as a major victory of the CALFED Bay-Delta Program, which is a 1994 joint federal and state program to restore

ecological health and improve water management in the San Francisco Bay-Delta ecosystem, the \$50.7 million Battle Creek plan contains positive and negative elements in both the final product and the process that led up to it.

The CALFED process successfully brought together the owner of the dams, Pacific Gas & Electric Company (PG&E); local landowners; the National Marine Fisheries Service; US Fish & Wildlife Service; US Bureau of Reclamation and the California Department of Fish & Game. However, river advocacy groups were deliberately excluded in the official process. These groups continued to fight

to be included, but the end result does not adequately represent many of their concerns.

A serious flaw in the final plan is that Eagle Canyon Dam is not slated for removal. Conservationists believe this dam may be key to successful recovery of rare Chinook salmon and steelhead. Those who lobbied the California Department of Fish & Game for the removal of Eagle Canyon Dam received a form letter indicating that there was opposition from local landowners on this issue. Instead, Eagle Canyon Dam will be fitted with \$2 million worth of screens and fish ladders, measures that may not adequately

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River Revival Roundup

Japanese Dam Removal Campaign Launched

In 1994 the gates closed on the Nagara Estuary Dam, impounding for the first time one of only two undammed rivers left in Japan. But the thousands of activists who fought the most celebrated river conservation campaign in Japan have not given up. They have persisted by calling for the permanent raising of these gates, and the restoration of the free flowing river. In just five years, commercial fisherman along the 160 km length of the river have seen catches steadily decline, in both number and size of fish, so much so that the commercial fishing has nearly disappeared. Some 100 species of fish once thrived in the Nagara, and it is now feared that many will soon disappear. With more than 30,000 dammed rivers in Japan, it is hoped that these efforts to continue fighting for the Nagara will stimulate decommissioning and dam removal initiatives on rivers in Japan, similar to what began in the United States a decade ago. For more information contact: Miori Aoyama, Society to Protect the Nagara River, e-mail: GHF00366@nifty.ne.jp.

Sierra Club Campaigns to Restore Hetch Hetchy Valley

The Sierra Club's Hetch Hetchy Restoration Task Force is spearheading a fight to restore Hetch Hetchy Valley in California's Yosemite National Park. The O'Shaughnessy Dam was built by the city of San Francisco for water supply and electricity in the early part of this century. In 1987, following Secretary of the Interior Donald Hodel's proposal to restore Hetch Hetchy Valley, the Sierra Club's Board of Directors reaffirmed its "historic and fundamental opposition to the damming of the Tuolumne River in Yosemite National Park," and called upon "all interests to take an open minded, long view of this issue, and to study and assess alternatives to meeting their needs and concerns through alternative sources of water, power and revenues."

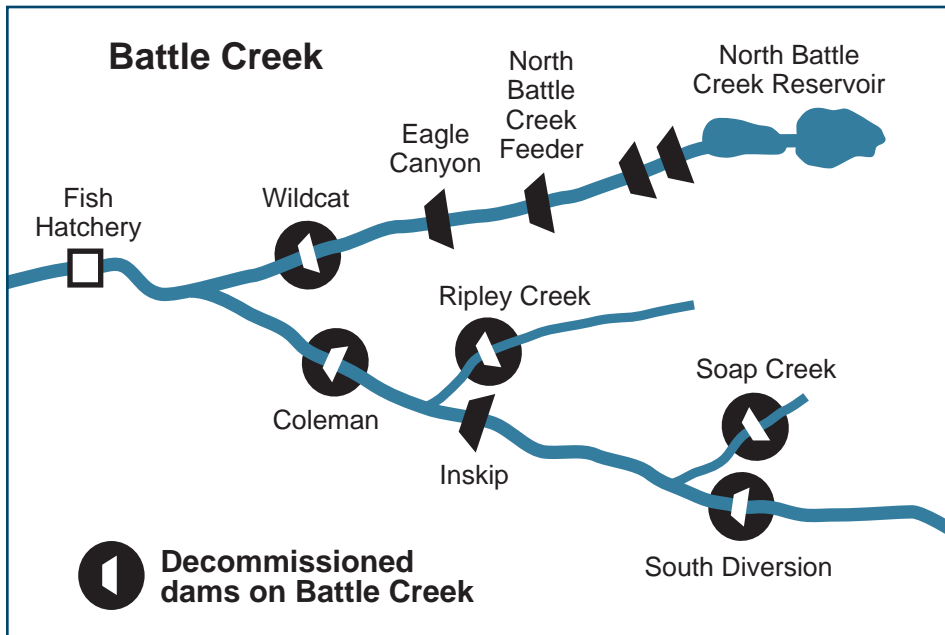
The Sierra Club is campaigning to restore Hetch Hetchy Valley to its natural condition and allow "one of nature's rarest and

most precious mountain temples" to be available for public enjoyment, to be reintegrated into its natural ecological system, and to provide for scientific exploration. For more information, visit the Sierra Club's web page, which includes its Action Plan for restoring Hetch Hetchy: www.sierraclub.org/chapters/ca/hetchhetchy, or contact Ron Good, Chair of the Hetch Hetchy Restoration Task Force, PO Box 289, Yosemite, CA 95389; (209) 372-8785; e-mail: rongood@inreach.com.

Removing Orphan Dams in Pennsylvania

In Northeastern Pennsylvania, the "storm of the century" hit Manatawny Creek near Potstown in the winter of 1996-97. Subsequent flooding and ice jams brought attention to "orphan dam #46-017" (an orphan dam is one without an owner). The dam had clearly exacerbated the already bad situation caused by the storm. Nearby resident Elisabeth Lynch took notice of the damaging impacts of the dam while walking by the creek, and brought it to the attention of other community members.

They decided to form the Greater Potstown Watershed Alliance in an effort to remove the nuisance dam and restore the creek. The alliance has partnered with state and federal agencies, other NGOs, and local politicians and are moving quickly toward their goals. Lynch says she was amazed by the widespread publicity given to this grassroots movement's efforts to remove a 6-foot high dam, and "thrilled to see the entire community galvanized and united by the project." Since removal of the dam has unanimous support, the remaining hurdle is the estimated \$65,000-\$90,000 price tag. Most of the money needed has already been secured from the National Fish & Wildlife Foundation and the Pennsylvania Department of Environmental Protection, and removal is scheduled for summer of 2000. For more information, contact Elisabeth Lynch at gpwa@yahoo.com.



quately prevent fish kills or facilitate access to crucial habitat.

Also receiving ladders and screens are Inskip and North Battle Creek Feeder dams. These measures, along with removal of Wildcat, Coleman, South, Lower Ripley Creek, and Soap Creek dams, will primarily be paid for by taxpayers. This part of the deal has the public paying for mitigation measures legally mandated by the Endangered Species Act and other legislation forbidding decimation of threatened species.

This is an especially dangerous precedent because it represents a potential disincentive for dam removal, says Steve Evans, Conservation Director for Friends of the River. "Often an owner opts to remove a dam because doing so is considerably cheaper than complying with environmental regulations," Evans explains. "If that incentive is removed because taxpayers will pick up the

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Africa

Uganda Dam Gets Parliament's Approval

by Lori Pottinger

In November 8, the Ugandan parliament gave the go-ahead for the construction of a US\$500 million hydroelectric dam on the Nile River by US-based company Applied Energy Services (AES), the largest independent power producer in the world. Parliament approved a government guarantee to underwrite electricity purchases from the proposed 250-megawatt dam by the state-owned Uganda Electricity Board (UEB).

The 22-meter-high dam will be privately funded and built (funding which is not yet secured), but cannot proceed without a guarantee that the project's power will be purchased. In case UEB fails to pay for this power, government must pay, hence the need for a government guarantee. Parliament approved a "build, operate, transfer" deal, in which Uganda will inherit the dam after 30 years (which is likely to coincide with the time it will need maintenance).

Environmentalists in Uganda had sought a court order to prevent construction, but the case was dismissed by a Kampala court in August, according to a Reuters story. The Bujagali Falls project would create a 390-hectare reservoir, flooding the Nile all the way to the base of the existing Owens Falls Dam.

According to project documents, construction of the Bujagali Falls Dam would result in forced resettlement for 820 people and affect, through submergence of communal lands and burial sites, an additional

6,000 people. The reservoir is expected to increase serious water-borne diseases like malaria and schistosomiasis. It would also submerge Uganda's most popular falls, and kill local tourism and the booming whitewater rafting industry (worth an estimated \$600,000 a year and growing).

The dam's power will cost more than most Ugandans can afford. A cheaper and more sustainable option would be to fix the existing power infrastructure system, which is very inefficient. Power losses through the existing UEB system amount to 30-40 percent, according to the *Uganda Monitor*. Uganda also has other power options that are moving forward now, including a hydropower project that will not have a reservoir and is expected to have few impacts.

The Bujagali dam has been a pet project of President Yoweri Museveni, who has been pushing hard for its approval. According to Uganda's *The New Vision* newspaper, Museveni told members of Parliament on September 22 that the US Secretary of Commerce had written to him asking the Ugandan government to expedite the implementation of the AES project. *The New Vision* reported that Museveni warned the MPs that the US official said a delay could cause AES to quit Uganda, which would discourage investors.

Reaction to the long-delayed parliamentary approval was mixed. The newspaper *The Uganda Confidential*, in a November 18 editorial, called the approval "a pyrrhic victory"

and said the parliamentary resolution "lacks legal validity."

The Confidential reported that the approval led to "much exhilaration, ululation and hugging outside parliament," and asked, "Is there no members' decorum after the debate of such a controversial motion? The whole country knew the efforts expended on getting parliamentary approval. The president had admonished parliament more than twice... If it was 'a victory and a great day for all the people of Uganda' why not leave it for the people to spontaneously celebrate in the streets, bars, night clubs and their homes? ... We should be mindful that 95 percent of Ugandans do not use electricity because they cannot and will not afford it."

And an article by a member of Parliament in the November 9 issue of *The Monitor* states, "Anyone knowledgeable in the electricity industry, including UEB and AES, know that UEB will default in the above payments. The Uganda government, even under the guarantee, would not, being a HIPC (High Indebted Poor Country), raise the payments from the consolidated fund and litigation will issue ... They may wish to take the risk knowing they can always exert political pressure, the precursor of extortionist foreign investment. What AES has to contend with, however, is that a different future government of Uganda can successfully repudiate the guarantee and compel AES to sell its own power." ■

After the Flood

Reparations for Dam Victims Needed to Right Past Wrongs

by Patrick McCully

In April 1998, the Indian *Express* newspaper published a horrifying story about female infanticide and baby selling in *adivasi* (tribal) villages in the southern Indian state of Andhra Pradesh. The story described how abject poverty had increased the value of boys and forced the *adivasi* to sell or kill their girl babies. According to the newspaper, every family in 60 hamlets surveyed had at least two cases of girl deaths. Ninety percent of children being sold for adoptions in Andhra Pradesh came from these hamlets.

What is unique about these hamlets? Why such a concentration of hideous poverty? Because, the *Express* explains, the families surveyed were “rehabilitated” in this dry and barren area after losing their ancestral lands to the huge Nagarjunasagar Dam. After 40 years of supposed rehabilitation and despite the nearby presence of the dam – one of the country’s largest irrigation and hydropower facilities – the villages have no roads, no power supply, no water pumps or faucets.

The plight of the Nagarjunasagar dam victims is depressingly unexceptional. Around the world, from Native Americans in the US to farmers in Thailand, communities are suffering the devastating aftershocks of losing to dams their lands, homes, jobs and life-sustaining resources like forests and fish.

The suffering of dam victims dates back mainly to the go-go years of the big dam era, the 1950s and ‘60s, when mass evictions to make way for dams first began on a worldwide scale. It is impossible to state with any accuracy how many people have been forced out of their homes by the world’s dams: 30 million would be the most conservative estimate, but the number could top 100 million. The official figure for the number evicted in China alone between 1950 and 1989 is 10.2 million, but Chinese dam critics claim the true number could be as high as 60 million. For India, credible estimates range between 14 and 40 million. Little is known about the great majority of these people, but based on what evidence there is, these many millions have been left economically, culturally and psychologically battered by forced resettlement.

And those directly displaced by reservoirs are only a fraction of the total number who have suffered the impacts of dams. For example, 11,000 people were flooded

out by Manantali Reservoir in Mali, but half a million peasants downstream are suffering the consequences of the changed flow regime of the Senegal River in terms of reduced access to floodwaters for irrigation, falling water tables, increased disease, and diminished fisheries.

The rate at which dams are being built is today far below its peak – according to dam industry figures around 5,400 large dams were completed during the 1970s, compared to around 2,000 in the 1990s. The main reason for the slow down in dam-building has been the growing strength of dam opponents. Since the mid-1980s, an international movement of

“Why didn’t they just poison us? Then we wouldn’t have to live in this shit-hole and the government could have survived alone with its precious dam all to itself.”

Ram Bai, who lost her land to Bargi Dam

groups fighting against dams has coalesced from a multitude of local, regional and national anti-dam campaigns and a smaller number of support groups working at an international level. Today, a new wing of the movement is emerging, one which is struggling for justice for past dam victims. This is a movement for reparations, or retroactive compensation, for those who continue to suffer physical, economic and cultural harm because of dams which have already been completed.

Dam victims in the past did not stop struggling for just compensation when the last bucket of concrete was poured on the dam which dispossessed them. But today the efforts of local groups fighting for reparations are as never before being heard at the national and international levels, and communities which had long ago given up the struggle are being inspired by other reparations campaigns to start agitating to finally win justice. Winning these reparations struggles is important not only from the point of

view gaining justice for those who have suffered, but also because of the need to hold governments, funders and builders of dams accountable for their actions and to impede them from doing more harm in the future.

Probably the first internationally supported document to call for reparations for dam victims was the 1994 Manibeli Declaration, which was endorsed by 326 human rights and environmental groups and coalitions in 44 countries. This declaration, which was written to coincide with the fiftieth anniversary of the World Bank, calls for a moratorium on World Bank funding of large dams until a number of conditions are met including the establishment by the Bank of “a fund to provide reparations to the people forcibly evicted from their homes and lands by Bank-funded large dams without adequate compensations and rehabilitation. The fund should be administered by a transparent and accountable institution completely independent of the Bank and should provide funds to communities affected by Bank-funded large dams to prepare reparations claims.”

Another widely supported document of the international anti-dam movement, the 1997 Curitiba Declaration, broadened the scope of its predecessor by calling for not just the World Bank, but “all governments, international agencies and investors” to implement a moratorium on large dam building. The Curitiba Declaration was approved at the first international meeting of people affected by dams, held in Curitiba, Brazil in 1997. This declaration proclaims that the conditions for lifting the moratorium should include that “reparations, including the provision of adequate land, housing and social infrastructure, be negotiated with the millions of people whose livelihoods have already suffered because of dams” and that “actions are taken to restore environments damaged by dams – even when this requires the removal of the dams.”

The need for reparation (or “restitution”) for those who have suffered past harm is well-founded in legal principle and accepted by the international community. Probably the first widespread use of the term was in the period after World War I, when Germany was forced to pay reparations to the Allied powers. Following World War II, Germany and Austria paid reparations to Israel and

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Photo: IRN

Participants of a 1997 meeting of dam-affected people in Brazil called for reparations and a moratorium on dam-building.

holocaust survivors, and Japan made reparations payments for acts committed during their occupation of Korea.

Other precedents exist where reparations have been paid for losses and suffering caused by states to individuals or ethnic groups within their own borders. The 1988 US Civil Liberties Act, for example, was designed to "make restitution" to Japanese-Americans who were interned during World War II. The act established a commission which oversaw the payment of claims totaling \$1.2 billion. Importantly, the stated purposes of the act included not only provisions for cash payments but also to "apologize on behalf of the people of the US" and to "acknowledge the fundamental injustice" of Japanese-American internment. Calls for dam reparations also include non-monetary measures, such as official recognition of injustices committed. The demands of the survivors of the Chixoy Dam massacres and evictions in Guatemala (see page 8), for example, include the construction of a monument to commemorate the 400 people massacred, and bringing to justice the paramilitaries responsible.

Chile's post-dictatorship Commission on Truth and Reconciliation envisaged three aspects to reparations for the victims of state torture, murder and disappearances: the disclosure of the truth and the "end of secrecy," the recognition of the victim's dignity and the pain suffered by their relatives, and measures to improve the quality of their lives. The recommendations of the Chilean "truth

commission" led to the establishment of a National Corporation for Reparation and Rehabilitation. The corporation has responsibility for assessing eligibility for and administering the reparations which include pensions, fixed-sum payments, and health and educational benefits.

South Africa's Truth and Reconciliation Commission has argued for a range of reparation strategies for both individuals and communities which suffered under the apartheid state. The TRC has recommended financial reparations in the form of both one-off payments and longer-term grants spread out over six years, and "symbolic reparations" which include erecting headstones and other monuments and renaming public facilities. The recommended community reparations include better access to health care and job-creation schemes.

Activists involved in the establishment of the World Commission on Dams (WCD) have ensured that this "truth commission" for dams is mandated to include recommendations on "restoration and reparation" in its final report. Many of the submissions which have been sent to the Commission deal with this issue and it was a prominent theme at the Commission's first two regional public hearings, held in Colombo, Sri Lanka, in December, 1998, and São Paulo, Brazil, in August 1999.

The presentation to the São Paulo WCD hearing by Brazil's National Movement of People Affected by Dams (MAB) states that

"The errors of the past must be acknowledged and responsibility for them must be assumed. It is ethically unacceptable, socially unjust, and economically irrational to begin new large dam projects before the social and environmental problems of earlier dams are thoroughly evaluated and resolved."

MAB's submission calls on the WCD to establish "principles and general guidelines" on reparations to be implemented by national governments and multilateral funders such as the World Bank. These principles should include the assumption of responsibility for the costs of reparations and the suspension of investment in new projects while ongoing problems remain unresolved.

The World Bank has already taken some steps toward reparations on a few projects whose social problems were particularly awful. Although these steps have not yet made much difference in people's lives, it does show that the Bank can be pushed into admitting some responsibility for its past actions long after its loans have been made. After the ecumenical human rights group Witness for Peace brought the Chixoy massacres to international attention in 1996, the World Bank was shamed into making some attempts to secure land for the survivors of the massacres and evictions. The Bank's final loan to Chixoy was made eleven years before.

World Bank approval of a loan for the Ghazi Barotha hydro project in Pakistan in December 1995 was made conditional on the resolution of disputes over compensation for people displaced 20 years before by Tarbela Dam, for which the Bank was a major funder. Sadly, although pressure from the Bank led to an independent review of outstanding resettlement issues at Tarbela, which is directly upstream from Ghazi Barotha, little progress has been made in carrying out the recommendations of the review.

This year, an attempt began in Zambia to raise the living standards of communities still suffering the consequences of displacement more than four decades ago by the World Bank-funded Kariba Dam (of course many of the original resettlers have died and many others, including the 23,000 displaced in Zimbabwe, will not be covered by this project). This rural development scheme forms part of a power-sector rehabilitation project funded by the World Bank.

While the need for reparations is clear, it is much less obvious how workable mecha-

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Resettlement Gone Wrong: The

As described elsewhere in this issue, reparations for those victimized by the construction of large dams is gaining support as it becomes clear that many dam-affected people have been left to fend for themselves by dam builders – their standard of living permanently lowered by the changes brought on by a dam, their communities torn apart, their children growing up without hope. Below are some examples of cases that are in particularly dire need of reparations.

Chixoy Dam, Guatemala

The massacre of around 400 Mayan Achi, mainly women and children, in the village of Río Negro in 1982 is a horrific example of the consequence of forcibly evicting people in a political context where violence is a standard means of resolving conflicts. These people had

refused to accept lands offered to them in compensation for the loss of ancestral lands to the World Bank-supported dam. Despite sending numerous missions to oversee the project, the Bank kept silent on the massacres



until 1996 when human rights groups forced it to undertake an internal investigation. This investigation found that the massacres had indeed occurred, but not surprisingly absolved the Bank from all responsibility for them.

The Bank's 1996 investigation concluded that massacre survivors were never adequately compensated and urged the Guatemalan authorities to provide survivors with more land. However by this time the power utility which had built the dam was undergoing privatization and claimed to have no money for land. The Bank then got a commitment from the National Fund for Peace to purchase the land. According to a Jaroslava Colajacomo from the Rome-based Reform the World Bank Campaign, Bank staff in Guatemala now consider the Chixoy issue to have been dealt with because "almost all relocated communities have reached the level they had in 1976 [when relocation began] or are about to reach it."

In other words, although the massacre survivors have suffered 20 years of extreme

"The soil is on everlasting property and it is for generations and generations. When we don't get enough compensation for our soil, it is the death of our children and the death of coming generations because they would have nothing to help them survive in their future."

Didian Malisemelo Tau
Resettled for Lesotho's Mohale Dam

deprivation, terror and murder of their loved ones, the entities which caused their plight believe that their responsibility is over because they have 'helped' the survivors claw themselves back to the standard of living they had 20 years ago. Colajacomo adds that the compensation measures which the World Bank claims have now been met were imposed on the communities in 1980 when the state was carrying out a campaign of genocide against the Mayan people. Furthermore, even these insufficient compensations have not been fulfilled, in particular the stipulation that replacement land should be of the same quantity and quality as that lost.

Itaparica Dam, Brazil

Some 40,000 people were displaced for construction of Itaparica Dam, and the federal São Francisco Hydroelectric Company promised resettlers they would get irrigation projects necessary for agriculture in the arid northeast of Brazil.

More than a decade later, and despite two World Bank loans totalling \$232 million, only 35 percent of the irrigation projects have been completed, and the great majority of the dam-affected population have been left high and dry. Many have even been forced to move to urban slums to try to find work.

Local populations, acting through a labor organization, filed two claims with the World Bank's Inspection Panel in recent years, but the Brazilian government managed to squelch an investigation that might have spurred corrective actions. The government convinced a narrow majority of the Bank's directors to defer action on the complaint, saying it would invest \$290 million to resolve the Itaparica resettlement problems, and would constitute an executive work group reporting directly to the Brazilian presidency. These funds have never been released.

Nor has the World Bank provided the necessary oversight to ensure that Brazil take effective pro-active measures. The Bank delayed a visit to the area for more than a year. Meanwhile, Brazil continued to violate loan conditions, and social conditions at Itaparica deteriorated even further.

Bargi Dam, India

Built between 1974 and 1990, Bargi was the first dam to be completed on the Narmada River. It has flooded more land than it irrigates. The Madhya Pradesh government estimated it would affect 101 villages, but when the reservoir filled, 162 villages were wholly or partially submerged. Many people were displaced twice by Bargi because their resettlement camps were built within the area flooded. Shripad Dharmadhikary of India's Narmada Bachao Andolan (NBA – Save the Narmada Movement), says, "The people lost not only their land, but access to even the common property resources. They lost access to grazing land. The fishing rights in the newly created reservoir were auctioned off to a big contractor and so the oustees could not fish for food or income. All in all, a prosperous, self-sufficient community was reduced to penury. Even starvation deaths were reported."

Soon after the reservoir began filling, affected people launched mass actions to demand proper rehabilitation. People reoccupied their own villages as the reservoir receded during the dry season and pledged to drown rather than allow the reservoir to fill during the monsoon. After several years, the government accepted that the people had not been "resettled" and established a rehabilitation committee comprised of representatives of the villagers, the NBA and the government. The committee's first action was to grant the rights to fish the reservoir to the villagers' cooperatives. Continued protests by the affected people forced the

Case for Reparations

government in 1998 to agree to lower the reservoir by four meters every December, thus making a relatively large and fertile area of land available for farming. Overall, however, five years after the committee was constituted, little progress has been made in restoring peoples' livelihoods.

Pak Mun Dam, Thailand

Communities affected by Pak Mun Dam have been engaged in a struggle for reparations since the World Bank-funded dam was completed in 1994. From the outset, the project was highly controversial due to the predicted impacts on the rich and productive fisheries of the Mun River, the largest tributary of the Mekong River. Between 1990 and 1994, there was intense opposition to the dam by local communities.

As a direct result of the dam, more than 25,000 people have been affected by drastic reductions in fish populations upstream of the dam site, and other changes to their livelihoods. Six thousand families have received some compensation for loss of fisheries during the three year construction period, but it is not enough.

On March 23, 1999, more than 5,000 villagers occupied the Pak Mun dam site and intend to stay until their demands are met. Villagers are demanding compensation from the Thai government and the World Bank of 2.4 acres of land per family for 4,500 fishing



families who lost fisheries income because of the project. In October 1999 the villagers announced that because the government had made no attempt to solve their problems, they were starting a campaign to

Theun Hinboun Dam, Laos

Communities affected by this project have yet to receive compensation for their losses. The Asian Development Bank-funded dam was completed in early 1998. By March 1998, thousands of villagers living downstream and upstream of the project were already suffering severe impacts to their livelihoods, including reduced fish catches, the destruc-

tion of food gardens and dry-season drinking water sources, loss of fish nets and increased difficulties with transportation.

Existing mitigation and compensation measures were grossly inadequate. Out of the entire \$260 million project cost, a total of only \$50,000 was allocated for all resettlement and compensation costs for affected local people, most of which was spent on purchasing land for transmission line towers. In November 1998, after sustained lobbying by NGOs, the ADB finally admitted that the project was having a substantial impact on people's livelihoods, and that they deserved compensation for their losses. However, as of August 1999, negotiations with villagers had still not begun and adequate compensation had not been provided to affected communities.

Villagers want fair compensation for loss of fisheries, fish nets and vegetable gardens, and deep wells to ensure a constant supply of fresh water. One villager told IRN in August 1999, "We are not greedy or picky people. We only want to be compensated for the difficulties we have had to deal with since the dam was built."

Kariba Dam, Zambia/Zimbabwe

From the early 1500s until the 1950s, the Tonga people lived along the Zambezi River in relative comfort. In the words of Chief Syakusule, "The river provided us everything – water, fish, wild animals to hunt, two harvests each year, and cultural ceremonies." But in 1957, the government summarily evicted the 57,000 Tonga from their ancestral land to make way for Kariba Dam. "Soldiers were sent by the government to kill people who didn't want to move. Bloodshed was done," Syakusule said. "When Kariba was built, the Tongas lost everything, but people in distant cities gained a great deal," said Fanuel Cumanzala, a descendant of one of the displaced families. Once they had lost their land, they depended on government handouts. When these stopped, many died, and 1957 became remembered as the "year of eating bones." The land on which they were resettled was dry, infertile and far from water, and the government refused to move Tonga burial grounds out of the reservoir area. No compensation was provided. To this day, the Tonga have benefited little from the dam, despite promises of electricity, water, roads, schools and clinics. In fact, the Tonga only received electricity two years ago – 40 years after the dam was

constructed. Tonga communities have recently begun to negotiate with the Zambian and Zimbabwean governments, however, to create a way for the Tongas to benefit directly from the dam.

Lesotho Highlands Water Project, Lesotho

Africa's largest infrastructure project has pushed a few hundred rural poor families even closer to the edge, by taking their land and replacing it with empty promises and deliveries of foodstuffs and animal fodder. A decade-old promise of new livelihoods has never come to pass. Although Callisto Madaovo and Jean-Louis Sarbib, the World Bank's vice presidents for Africa, say the Bank-funded project is "helping poor communities in Lesotho through a social fund," affected



communities say this fund is doing nothing. "The fund has been and continues to be a tool of opportunistic politicians" who have committed its resources to pointless pet projects, local NGOs declare.

NGOs working with project-affected people say that compensating those who lost land with cash has not succeeded in restoring livelihoods. Paying people in cash instead of land arose because Lesotho ostensibly did not have enough land to supply all those displaced by the project. But NGOs propose that South Africa, the beneficiary of the project, supply the missing land. "It seems only fair," they say, "that submerged land be returned to Lesotho by South Africa in the form of annexed lands for resettlement sites." The groups would also like the development fund to be locally managed, and for guarantees to Lesotho that its citizens have the right to use water from project reservoirs if drought or development efforts necessitate it. ■

Photos: Opposite page, this Mayan priest's family was killed in Chixoy Dam Massacres. This page, left: Villagers occupy Pak Mun. Right: Lesotho villagers displaced by Katse Dam.

Two Decades of Struggle for Just Resettlement: The Story of Itá Dam

by Monti Aguirre & Patrick McCully

At first glance, nothing seems amiss about the twin bell towers and yellow façade of Itá church. But look more closely, and it becomes clear something is very wrong. The church façade stands alone like a gravestone; the rest has been demolished.

The gravestone-church overlooks a ghost town of rubble and rampant vegetation. Ten years ago, the 12,700 residents of the small southern Brazilian town of Itá moved to make way for a reservoir. The 14,000-hectare reservoir of the long-delayed Itá Dam may finally start to rise by the end of this year, some eight years behind schedule.

The people of Itá first learned the fate of their town in the late 1970s, when state-owned utility Eletrosul announced plans to build 22 hydropower dams on the upper Uruguay River and its tributaries. Over the following decade, church activists, rural unionists and academics helped to mobilize a grassroots movement of people to be affected by the dams, especially the farmers to be displaced by the first two dams to be built, Itá and Machadinho. This movement, the Regional Commission of Dam-Affected People (CRAB), steadily grew in strength through the 1980s and pressured Eletrosul through holding marches and rallies, blocking roads, occupying the utility's offices, and sabotaging its land surveys by pulling up survey stakes and detaining surveyors.

By 1987, CRAB had forced Eletrosul to sign an accord making significant resettlement concessions, including that all farmers displaced would be offered land of equivalent quality and value (to be determined with the participation of the farmers), and that landless farmers to be displaced would be eligible for land at resettlement sites. CRAB's resistance together with financing problems forced long delays in the construction of Itá and then its suspension in 1990. CRAB also forced Eletrosul to redesign Machadinho Dam with a smaller reservoir and less displacement.

Then in 1996, Eletrosul kick-started the Itá project by awarding a heavily subsidized concession to build and operate the dam to a consortium of private Brazilian investors.

The 125-meter-high dam may start generating power in mid-2000. The dam was originally planned with an installed capacity of 1,620 megawatts, but it was reduced to 1,450 MW when it was privatized, presumably because Eletrosul's engineers had exaggerated how much energy they could produce at the site. Machadinho was also stalled, then privatized and restarted and is currently under construction.

The concessions which CRAB forced from Eletrosul were threatened in 1997 when the utility was broken up under Brazil's electricity sector restructuring. Eletrosul's role in the Uruguay River dams has now been replaced by Gerasul, the majority shareholder of which is the Belgian multinational Tractebel (itself now owned by giant French conglomerate Suez Lyonnaise des Eaux). CRAB responded by putting the heat on Gerasul, most notably when hundreds of farmers occupied company offices in 1997.

Despite the 1987 Eletrosul-CRAB accord, numerous problems continued with the resettlement process. The utility dragged its feet on negotiating purchases for the resettlement sites, and pressured rural families to accept prices below market value. CRAB continued holding demonstrations and occupations and succeeded in winning further gains, perhaps most importantly that funds from Eletrosul for building the necessary infrastructure at the resettlement sites would be managed by CRAB itself. This has meant that houses, barns and community buildings have been built by the resettlers themselves rather than Eletrosul contractors, ensuring that they are bigger and of better quality than originally planned.

Itá is the first large dam to be funded under the Inter-American Development Bank's (IDB) new private sector funding initiative, through loans and guarantees of US\$341 million. CRAB demanded that the IDB withhold financing for the project until all outstanding and environmental problems were solved, a request the IDB ignored.

At the Site

A group of about 25 men wait for us as we arrive at Barracão, one of the resettlement

sites for Machadinho Dam. The men, who have been working on building their houses, greet us with gourds of the tea known in Spanish-speaking countries as *mate*.

Barracão is set in an open landscape of rolling hills covered in a patchwork of woods and fields. Each of the families has the right to receive at least 15 hectares of land, but most of the allotments at Barracão



The gravestone-church of Itá.

Photo: Patrick McCully

are 17-20 hectares depending on family size. The resettlers also get five years' financial help to enable them to improve their new lands and technical advice from agricultural extension workers. Approximately 70 percent of the region's population are small farmers, most of them descendants of Germans and Italians who emigrated to southern Brazil about a hundred years ago.

"I'm sad to leave my old farm," said Wilson Rufato, "but the land here is more fertile. We'll also get running water and electricity which we didn't have before."

Lucimar Da Silva proudly showed us around his almost-complete new home. It's a solidly built five-room house. Before resettlement, he was a sharecropper on ten hectares; now he has title to 26 hectares. Da Silva's main concern is that after three years

continued opposite

Itá continued

he will have to start to repay the power company the difference in value between his old holding and his new land. He thinks that maybe a quarter of the corn he expects to grow each year will be needed for repaying the loan.

At Campos Novos (New Fields), one of seven resettlement sites for Itá Dam, we meet a group of families who've been living here for a year. Gilvane Gauger told us that the area had belonged to a big landowner. "It was all brushwood and forest, but with the help of an agronomist, we chose it because it is fertile land," said Gilvane. "We still have to build the church, school and other community buildings. This year we are trying organic fertilizers and reducing our use of pesticides. We built six fish ponds which the community will manage as a cooperative," he said.

MAB, the national movement of dam-affected people in Brazil, is demanding that repayments to Gerasul be used to fund the resettlers' cooperatives. "We're about to take six bus-loads of farmers to Gerasul's office in Florianopolis to press for this demand," said Gauger.

"The children are going to school, and we now have a project to complete the road which surrounds our new settlement," said Lourdes de Sousa from Campos Novos. "Life is better now. I used to work in the fields on my own, and now we work collectively. This is something that we learned in this struggle – to work and keep together," she said.

"We had to fight for a good resettlement and we got it, but do you know how it feels when you have been raised close to the river and you are asked to leave your roots behind and go somewhere else? Nothing will compensate for that," said Gilvane Gauger. "If you are forced to leave, then you have to make sure you get better resettlement, compensation, and a better way of living. Good resettlement is the minimum that can be given to people. And not all have been resettled yet. Also, the resettlement means that you have to displace another person from somewhere else to take their place."

"Many people will end up better off after resettlement because of Itá and Machadinho," said Wilson Rufato. "But it still doesn't compensate us for all that we've gone through – 20 years of uncertainty and struggle. If we'd known at the beginning what we know now we'd have fought to stop the dam ever being built." CRAB are totally opposed to the Foz de Chapecó Dam, planned to be built across a tributary of the Uruguay downstream of Itá. At two other proposed dams further upstream, Barra Grande and Compos Novos, MAB is demanding that no work begin in the riverbed until agreements are reached to resolve all the social problems the dams will cause.

Edilson Patzlaff from Compos Novos says that they could have stopped Itá but didn't "because some people did not join CRAB, there wasn't a strong organization at the beginning, and some people had a very difficult financial and agricultural situation – and

they gave in to the company. It is really important to be united, and not to give up. You have to keep on pressuring the company."

Around a third of the farming families displaced by Itá and Machadinho did not join CRAB, and instead opted to accept a letter of credit so that they could purchase property on their own. According to Rufato, many of these families now regret this decision as they have been split up from their neighbors and are finding their new lives difficult without the community support available at the resettlement sites. Storekeepers and other small business owners whose livelihoods have been affected by Itá are also deeply unhappy about the way they've been treated by the project authorities.

The seriousness of unresolved compensation and resettlement problems at Itá was strikingly illustrated in October, when 600 MAB supporters took over the dam site, paralyzing construction work. The occupation lasted for five wet, near-freezing days. It was called off after winning important concessions, including additional funds for resettlement sites and agricultural extension services, and the opening of negotiations with high-level officials.

"To mobilize, to lose working days, to spend days at the occupation camp, is not a good thing, it's not something we do on a whim," said Romani, one of the farmers affected by Itá who occupied the dam site. "But we did it because it's the only way that Gerasul and the government will listen to us and deal with our demands." ■

Reparations continued from page 7

nisms can be established for holding dam builders and funders responsible for past damage, and for ensuring that reparations are paid in a timely and fair fashion. One possibility is that international agencies, companies and national governments which have funded dams could be required to put money into reparations trust funds. These could be calculated (on the donor side) as a percentage of the interest that the donors have received in repayments from dams, on the company side as a percentage of their dam-related income, and on the government side as a percentage of receipts from sales of power and water. Funds could also come from a reparations tax levied on all future dam-related contracts (including for maintenance, upgrading and refurbishment of existing dams).

Key to the success of any reparations funds will of course be the structures for

overseeing and implementing how they are spent. While these structures would have to vary according to local contexts, one essential principle would be that affected communities would have the ultimate say in any decisions on compensation payments and social development or environmental restoration projects. Reparations committees, including representatives of affected communities, governments, and in some cases perhaps international agencies, could be set up at the project, regional or national level. The committees would establish priority uses of reparation funds and monitor payments and projects paid for by the funds.

An interesting mechanism was used at Thailand's Pak Mun, where two years after completion of the dam the Thai electricity utility was forced by villager protests into paying retroactive compensation for fisheries

losses suffered during the three years while the dam was under construction. More than 6,200 families received cash payments of US\$1,200 dollars, with additional amounts of between \$1,200 and \$2,400 per family paid into a villager-controlled agricultural co-operative (the villagers are still fighting for compensation for on-going fisheries losses due to dam operation).

These are just some of the possible mechanisms which should be explored by the World Commission on Dams: much more creative thinking is required on this issue. While reparation mechanisms are being explored, common sense dictates that construction of new dams should be halted and should not restart until governments and agencies have shown that they are capable of fulfilling their promises to fully compensate and rapidly reestablish the living standards of those they displace. ■

SHORTS

Pemon Indians in southern Venezuela toppled four transmission towers in late September to protest the lack of negotiations by the government with communities affected by the 600 km., US\$150 million Guri Dam–Boa Vista, Brazil power corridor. The indigenous communities interrupted traffic on the road connecting the two countries, before they were surrounded by the Venezuelan military. The power line affects 15,000 indigenous people in over 30 communities of the Akawaio, Arawako, Pemon, and Karina tribes. Indigenous people say the power line will have serious environmental impacts on the pristine tropical forest and savanna ecosystems, and will boost industrial gold mining and logging in the region.

A Florida man convicted of dumping waste into Tampa's waterways has been handed the longest prison sentence ever given in a federal environmental case, reports Environmental News Service. In August, Gary Benkovitz was sentenced to 13 years in prison for ordering his employees to discharge hazardous waste, including pesticides, heavy metals and toxic solvents, into a storm sewer that empties into a bay near Tampa.

A federal district judge in Sacramento, California ordered a developer on November 8, 1999 to pay up to \$1.5 million for destroying wetlands. The fine is the largest wetlands civil penalty ever imposed by a US court. The developer, Angelo Tsakopoulos, was charged with 358 violations of federal environmental laws for wetlands destruction on his 8,348-acre ranch.

Nine demonstrators scaled London's new Millennium Wheel in late October to protest dam projects in Spain and India. The demonstration was mounted by the group *Solidarios con Itoitz*, which opposes construction of the Itoitz reservoir in Spain's Basque country, and an Indian Group called *Narmada UK*. The demonstrators unfurled banners reading "Stop The Dams" during the 30-hour demonstration. Two of the demonstrators were arrested.

News Briefs



UPDATES

MALAYSIA: The forced relocation of nearly 10,000 indigenous people for Malaysia's once-shelved and now massively scaled-back Bakun Dam was completed in August. NGOs have described the forced relocation as ethnocide. "It is difficult to adequately capture in words the utter desperation and dislocation being experienced by the indigenous communities," said a recent report by NGOs entitled *Empty Promises, Damned Lives*. "A gaping hole has been blown in their social fabric; their culture and their future is in serious jeopardy." Kua Kia Soong, a representative of the Coalition of Concerned NGOs on Bakun, reported that those who have been resettled – 200-300 kilometers away from their original communities – have lost interest in traditional activities. "They don't have peace of mind even to weave baskets, a traditional activity, and have resorted to alcohol. When we talk of ethnocide, we are talking about very visible disappearance of a culture," said Kua.

The Bakun Dam, one of Southeast Asia's largest infrastructure projects, was shelved in 1997 due to its lack of financial viability. However, in early June, the Malaysian government announced its intention to resume the controversial project. In November, jailed former Malaysian finance minister Anwar Ibrahim revealed that Prime Minister Mahathir Mohamad ordered him to bail out dam developers using public funds without going through proper auditing or accounting procedures. Project contractor Ekran said in October that it had relinquished its rights to the project and that the government would pay over \$250 million in compensation to dam developers, contractors and lenders. *Susanne Wong*

CHINA: The German Government has granted another export guarantee for the construction of the Three Gorges Dam on the Yangzi River (it granted a first guarantee in 1997). Minister of the Economy Werner Muller said the government approved the request from Siemens and the German

export-credit agency *Kreditanstalt für Wiederaufbau (KfW)*. According to the Minister of the Economy, the guarantee of US\$52.9 million, covers the financial risks for the company to supply 15 transformers for the hydropower plant. Siemens received the approval on October 12. A spokesperson for the Ministry said the application had come in during the time of the previous coalition government, which had given an approval in principle, and that this possibly has led to a legal obligation to Siemens. When they were in opposition, the SPD party and the Greens had condemned any support for the dam, and rejected an earlier guarantee of the past government for turbines and generators. Together with 57 other environmental and human rights organisations, the German NGO *Weed* demanded that no guarantees be provided for the construction of the dam. The project will cause the forcible resettlement of up to 1.9 million people. *Doris Shen*

FISH STORIES

NORTH AMERICA: Fresh water species are the most endangered in North America and are dying out five times faster than those on land, according to a new study published in the October issue of *Conservation Biology*. Warning that the US could lose most of its freshwater species in the next century if nothing is done, one of the authors, Anthony Ricciardi of Dalhousie University (Halifax), said, "A silent mass extinction is occurring in our lakes and rivers." The authors called their estimates "conservative," and said that freshwater animals may be dying out as fast as rainforest species, considered by many to be the most imperiled on earth.

Since 1900, at least 123 freshwater animal species have been recorded as extinct in North America, from snails to amphibians to fish. Many considered at risk are expected to disappear within the next century. At risk species account for almost half of the remaining 262 mussel species, one-third of the 336 crayfish species, 26 percent of remaining amphibians species and 21 percent of remaining freshwater fish.

The scientists identified the most serious threats as dams, introduction of non-native species, and pollution. The authors say that the relicensing of US dams is an opportunity to reduce the threat of extinction and re-establish natural flows in many rivers.

US: "Crash-test salmon" made their debut in the summer of 1999, in an effort by dam engineers to try to refine the fish-killing turbines that create hydropower. "Flubber," a 6-inch rubbery replica of a young salmon packed with wires and sensors, was scheduled to spurt through the churning, 10-foot-long blades of the McNary hydropower dam on the Washington-Oregon border in July to measure what salmon go through on their treacherous journey downstream.

"The idea is to document with data what fish experience," said George Hecker, president of Alden Research Laboratory Inc. in Holden, Mass.

The synthetic salmon was developed at the Energy Department's Richland, Wash., lab as part of a five-year, \$8 million government effort to make hydropower dams more fish-friendly. Millions more have been spent by dam operators on similarly unique and usually futile efforts to save salmon from disappearing on dammed rivers. In the Pacific Northwest, 16 salmon species are considered threatened or endangered, and Congress has authorized more than \$100 million a year for attempts to bring them back. The disappearing salmon runs are a major reason many groups are pushing for the removal of four dams on the Snake River.

Government scientists and some corporate partners, including Alden and Voith Hydro Power Generation of York, Pa., want to use the Flubber data and studies of real salmon to make better turbines. A spokesperson for Voith said it may be possible to increase the survival rate at a dam to 98 percent by changing the shape of turbines.

A BETTER WAY

FUEL CELLS: Ford Motor Co. opened America's first hydrogen fueling station earlier this year at its research facility in Dearborn, Michigan. The \$1.5 million fuel station provides both liquid and gaseous hydrogen, and will allow tests of fueling technology including nozzles and storage. Ford is expected to spend more than \$1 billion on alternative fuel research over the next five years, including \$400 million on hydrogen based projects. Ford and other automakers have pledged to bring fuel cell powered cars to market by 2004. The fuel station will help Ford test its P2000 fuel cell

prototype car, which uses hydrogen and water in a chemical reaction to generate electricity for an electric motor. The nation's second largest automaker also announced plans to develop an experimental car powered by a hydrogen-burning internal combustion engine by the end of the year. Ford displayed a working 2.0 liter engine fueled by hydrogen. A car equipped with the engine would be 25 percent more fuel efficient than a gas-powered vehicle, and produce no hydrocarbon, carbon dioxide or carbon monoxide pollution. Emissions of nitrogen oxide would meet proposed federal clean air standards.

Meanwhile, at the Department of Energy, the goal of developing highly efficient, low or zero emission automobile fuel cells took a big step forward thanks to a tiny part that converts readily available gasoline into hydrogen to power a fuel cell. Because hydrogen filling stations are not yet in place, fuel-cell-powered vehicles will for some time need to convert standard gasoline into hydrogen. The Department of Energy's Pacific Northwest National Laboratory have successfully demonstrated the technical feasibility of an ultra-compact fuel reformer that converts gas to hydrogen without sacrificing efficiency.

"This microtechnology is significant," said Dan Reicher, Assistant Secretary for Energy Efficiency and Renewable Energy. "Not only will it reduce the size and weight of on-board fuel reformers, but it also will decrease fuel cell system start-up time." Reducing the size of the hardware may also reduce the price of fuel cell technology.

WIND POWER: US Energy Secretary Bill Richardson has announced a plan to produce 5 percent of the nation's power from wind by 2020, up from 0.1 percent now, the *New York Times* reported on June 19, 1999. The federal government – the nation's largest electricity customer – will rely on wind for 5 percent of its power five years sooner, according to the plan. The department plans to encourage "wind-friendly codes and covenants," invest in research and development, and encourage vocational schools to train "windsmiths" to install and maintain the new system of wind turbines. By the end of June, the US was expected to add 900 megawatts of wind power, up from 1,600 MW for the entire country to 2,500 MW. The price for wind power in the US is now at about 5 cents per kilowatt-hour. The average American residential customer pays about 7 cents per kilowatt hour currently.

THE WORLD: There is a clear link between energy poverty, hunger and ill-health for nearly one in every three people on Earth, says a new report by the London-based World Energy Council (WEC) and the United Nations' Food & Agricultural Organization. "The majority of these two billion people live in the rural areas of developing countries," says WEC secretary general Gerald Doucet. "We cannot alleviate hunger without solving issues of energy supply and use."

The report examines a number of options for the generation of electricity, including biomass, wind, photovoltaic, solar thermal, micro-hydro, hybrid systems and energy storage. The key to solving the massive energy problems of people in the rural areas of developing countries without access to commercial sources of electricity is to change the mindset of developed nations, the report concludes. The report advises that the people who will use the power should play an influential role in the planning process. The needs of rural residents must be considered when planning and implementing new power projects, to ensure that investments are not squandered.

More than half the world's population lives in rural areas using wood, dung and crop waste for fuel. "This combination barely fulfills the energy requirements of the basic human needs of nutrition, warmth and light, let alone the possibility to harness energy for productive uses which might begin to permit escape from the cycle of poverty," the report points out.

It is estimated that seven percent of current global electricity generation could meet the basic human needs of rural people in developing countries "but, in an age of apparently advanced technological and management skills, we have failed this relatively modest challenge," the report says.

Most developing nations have rural electrification programs that promote renewable energy sources or grid extension. "In principle, renewable energies, such as photovoltaics and wind power, should find good application in rural areas, but they play a minor role at this time," the report concludes. The costs of electrification are underestimated while the benefits are overstated, and switching to modern energy systems costs more than rural households can afford.

The report examines a number of renewable energy technologies and rural electrification, including solar home systems in Indonesia, leasing of solar systems in the Dominican Republic, financing of solar systems in India, and solar rural electrification in Morocco. ■

Charges of Fraud Dirty Hidrovia Waters

by Glenn Switkes

Two groups of scientists who contributed to official environmental impact studies for the Araguaia-Tocantins Hidrovia industrial waterway in central Brazil have charged that their findings, which were critical of the project, were deliberately watered down and distorted by Transportation Ministry officials.

On October 25, federal judges in two different states issued court orders suspending the licensing process for the project. The project involves five states, and therefore will be licensed on the federal level.

In his opinion, Judge César Augusto Bearsi of Mato Grosso said, "Frankly, a project of this size cannot be based on a farce, nor can the results of studies be presented to the public [as if] they are real and serious, when in fact they were adulterated. If the public hearing were permitted to take place, the public would know only those facts 'chosen' to show to them rather than the complete studies carried out by qualified professionals."

Charges of fraud on the EIA had come from anthropologists and biologists who took part in the studies. In August, four anthropologists revealed that the content of their opinions were "mutilated" by the Araguaia-Tocantins Hidrovia Authority (AHITAR), the agency responsible for the studies. The scientists' unadulterated findings were that the project could seriously affect indigenous communities, even leading to the death of some indigenous people as a result of water pollution and impacts on fisheries, an important food source for native communities. According to an open letter circulated by the anthropologists, "we consider the present version of the EIA to be concerned only with the desire to make the project feasible, without considering its grave implications for the future of indigenous groups." Responding in the press, Transportation Ministry officials said that the anthropologists lacked the technical capacity to comment on such matters.

Biologist Afonso Pereira Fialho, a fish expert from the Goiás Catholic University who worked on the EIA, said that his findings predicting "intense" impacts on fish populations with resulting consequences for riverbank dwellers had been omitted from AHITAR's report.



Small barges can already navigate the river year-round.

Photo: Glenn Switkes

Communities Left Out

In another indication of the project's corrupt practices, civil society organizations from the region say that Brazilian environmental officials are deliberately restricting the public hearing process to communities where local interests support the hidrovia.

In Goiás state, federal judge Carlos Humberto de Souza issued another order paralyzing the approval process for the hidrovia. In his opinion, he noted the limited range of sites available for public comment: "It is obvious that these hearings are being chosen to take place in small towns, with limited cultural, technical, and scientific resources. What technical expert or scientist will travel at his own expense to these remote towns?"

Only three days later, the Transportation Ministry obtained a judge's decision overturning the court orders in a higher court, which should permit the hearings to move ahead. Residents of the capitals affected by the project and indigenous and riverine populations had unsuccessfully petitioned for public hearings in their communities.

The hidrovia plan involves straightening and deepening the channels of the Araguaia, Tocantins, and das Mortes rivers by dredging and altering rock formations along more than 2,000 km of the river system, as well as construction of an artificial canal to bypass rapids. The project will also require the expansion of barge fleets, and port, railroad,

and road construction – elements whose costs are not estimated or included in the project's overall costs. The project is designed to lower the cost of soy exports to European markets.

Critics of the project say that the river highway will also be used for shipping fuel, pesticides, and chemical fertilizers which could have a serious impact in the case of navigation accidents. They also question the economic feasibility of the project, given that there are alternative routes for shipping grains via the new Ferronorte, railroad, roads, and the Madeira River. The project would directly affect 11 indigenous ethnic groups, and dozens of indigenous and natural reserves along the principal river system of the eastern Amazon. A dozen indigenous groups have expressed their opposition to the project, and demanded respect for constitutional guarantees which require consultation with affected indigenous communities before river infrastructure projects may be built. ■

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fish, medicine and salt. The reservoir area is now plagued by salination as it is situated directly above a large salt dome, making the reservoir water unsuitable for irrigation.

A Long Struggle

Because no EIA was done, the number of affected people was never determined. NGOs estimate that more than 3,000 families, or 15,000 people, have lost farmland to the reservoir.

In 1994, responding to public pressure, the DEDP constructed a dyke to attempt to reduce the number of affected villagers. However, the dyke created worse impacts, blocking natural drainage patterns and flooding vast areas of farmland.

In 1997, Rasi Salai villagers joined the mass movement, Assembly of the Poor, in a 100-day demonstration outside Parliament House in Bangkok. Bowing to pressure, the former Prime Minister, General Chavalit, agreed to compensate 1,154 families for loss of farmlands, fisheries and other livelihood sources.

However, more than 1,800 families remain uncompensated. Those families who received compensation were later subjected to intimidation, harassment and threats of lawsuits by the new Chuan government, which accused villagers and the Assembly of the Poor of embezzling money.

On April 20, 1999, more than 2,000 villagers from the Assembly of Mun River Basin and Assembly of the Poor occupied the dam site and stayed for three and a half months. The government ignored them.

In order to draw the government's attention to their plight, the frustrated and angry villagers decided to take their struggle to the next level. In August, more than 1,850 people created a new village in the reservoir area on the site of their old one and named it "Mae Mun Man Yuen Village #2." They grew rice and vegetables in their old area, fished in the river, and collected non-timber forest products from the nearby forest. They announced that they would stay until their demands were met.

The DEDP responded by filling the reservoir, engulfing the makeshift village and crops. The DEDP flooded the land in order to avoid conducting a ground survey which would determine the exact number of people affected by the reservoir. Even though the recent decision to reduce the height of the reservoir may be construed as some kind of a victory, the villagers have still not had their substantive demands met, and say they will continue their fight. They are now establishing a permanent settlement in the area, and every day they plead to the spirit of the Mun River to protect their lives.

Pha Kongdhamma, one of the affected villagers, said, "This dam has taken everything from many people. We are not only fighting for ourselves but also for our descendants. If the government does not take responsibility, we think they should remove the dam." ■

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one billion peasants to use more electricity," reports the *South China Morning Post* August 28, 1998).

World Bank Guaranteed to Gain

Construction of the 245-meter-high dam was carried out by a consortium including Impregilo of Italy and Dumez of France, both of whom were recently implicated in a corruption scandal over another large dam, Africa's Lesotho Highlands Water Project (see p. 16). Engineering management came from Harza Engineering of the United States,

the Advisory Group of Norway, and Hochtief of Germany. General Electric Canada provided the turbines.

The World Bank is confident of that its loan will be repaid on time because of a Ministry of Finance guarantee. However, a World Bank official expressed concern over the project and said talks were under way to find a solution to the grave financial problems. This may include rescheduling or refinancing its debts.

The project displaced some 35,000 people, inundated 10,100 hectares of land (1,656

hectares of cultivated land, which represents the loss of 15,000 tons of grains per year minimum), and affected the habitat of many rare species including pandas, golden monkeys and others. The reservoir is expected to have impacts on water quality, human health (by increasing rates of malaria and schistosomiasis), increase landslide potential and harm fisheries. Dam safety is another issue whose effects remain unknown, but it is recognized that the area could be subject to reservoir-induced seismicity. ■

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tab, then we are likely to see fewer removals – which are generally the best way to restore habitat – and more 'mitigation' efforts like screens and ladders."

PG&E's only contribution to financing the restoration measures will be a loss of \$20 million in revenues from electricity generation – an amount which otherwise might have been added into the cost of the dam removal.

Additionally, if project costs exceed current estimates, no mechanism is in place to secure additional funds. It is most likely that a scaled back version of the plan would be implemented, or more money would need to come from taxpayers.

However, if the entire plan is carried out as presented, the benefits will extend beyond saving salmon and steelhead. Higher flows will increase production of other resident fish, and also promote growth of vegetation. Increased water availability will help produce more rigorous stands of plants in the riparian zone, including elderberry bushes, which are critical to the survival of the threatened elderberry longhorn beetle.

Improvements in the riparian corridors will increase habitat for several mammals, including the river otter, long-tailed weasel and muskrat, while providing migration corridors for other mammals and birds. Higher

flows in Battle Creek will also improve habitat for amphibians and reptiles.

The benefits of restoring Battle Creek are vast. As Evans enthusiastically acknowledges, "This plan is a great first step." But concerns about the process remain. Says Owen Lammers, who heads the River Revival decommissioning project at IRN, "The CALFED process vividly illustrates the need for inclusionary planning and financing mechanisms which require dam owners to be held responsible for measures that prevent them from devastating river systems." ■

Companies Charged with Corruption on Lesotho Dams

by Lori Pottinger

Ten companies and two consortia were summoned to appear in a Lesotho court on November 29 on charges of bribing Masupha Sole, former director of the Lesotho Highlands Development Authority. Sole is accused of accepting around US\$2 million in bribes from the companies, which included major dam-building firms from Europe, Canada and South Africa.

The accused companies worked on the Katse Dam, the first of five huge dams planned for the Lesotho Highlands Water Project (LHWP). Katse is now completed and work has started on a second dam, Mohale.

The World Bank has provided both fiscal management and loans for the Lesotho project, and is currently carrying out an internal investigation of the LHWP contracts it has financed. According to public statements made by World Bank staff, the Bank is planning to take sanctions only against companies that had direct contracts with the Bank. Companies which paid bribes on other project-related contracts would thus be exempt.

In a November 26 press release, IRN called for the dam-building companies charged with corruption to be suspended from receiving World Bank contracts while they are under investigation. IRN is also calling on the World Bank to establish an independent investigation of its role in the scandal.

Critics argue that the Bank's responsibilities are not restricted to individual contracts because of the Bank's role in getting the project off the ground, and as its fiscal manager. They argue that the World Bank is interpreting its procurement guidelines narrowly in hopes that they will not have to apply them to some of the biggest dam building companies in the world.

"Such a narrow interpretation of its procurement guidelines may be in keeping with the letter of the guidelines, but it is certainly not within their spirit, nor the spirit of President Wolfensohn's frequent anti-corruption statements," says Patrick McCully of IRN.

In an unusual move, the World Bank has pledged financial and other support for the Lesotho justice department in its pursuit of

this case. But critics argue that this support is inappropriate because the World Bank is the fiscal manager and a funder and promoter of the project with a long-standing and close relationship with the companies charged.

"The Bank is not a knight coming to the rescue of the government of Lesotho. It is a leading actor in a major corruption scandal. The set-up gives little reason for confidence that justice will be served," says McCully.

"It's time for an independent investigation that considers not just the role of the companies, but the performance of the World Bank in its oversight responsibilities," McCully says. "We need to know what the World Bank knows about the bribes, and when it first knew it. We know from past experience that internal World Bank investigations cannot be trusted to reveal the truth."

IRN also called for the establishment of a Commission of Inquiry that would include representatives of local non-government organizations, to investigate more allegations of corruption among former and current senior officials. ■

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