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*International Rivers Network*

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### IN THIS ISSUE

- **Cover Story:** "Hidrovia Plans Propose Heavy Engineering for Pantanal".
- **Commentary:** The issue's patchwork of stories reveals the range of threats facing rivers today.
- **Europe:** The Elbe is saved from destructive navigation changes.
- **Europe:** A one-time dam site on the Danube becomes a national park.
- **Japan:** A flood control scheme on the Chitose Rivers would have far-reaching impacts.
  - **Japan:** Diet members speak out for rivers.
- **Brazil:** The last of the "dinosaur dams" from the former military regime begins filling.
- **PR Patrol:** A look at the use of public relations to sell destructive river projects - in the case, Africa's Lesotho Highlands Water Project.
- **Interview:** Talking about river restoration with Douglas Shields.
  - **River Restoration:** A few "works in progress" to restore large rivers.
- **Alternatives:** South Africa proves that coal-fired countries need not remain forever "fossilized"
- **Namibia:** New sites for Epupa Dam to be considered.
- **News Briefs:** Watching the world's rivers.
  - **Shorts:** Contaminated drinking water, Sri Lanka and Kyrgyzstan.
- **IRN News:** River of Words contest for children.
- **Hot Off The Press:** A new book on dams.
- **Stop Press:** Germany's export-import bank lends for China's Three Gorges Dam.

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*Volume 11, Number 5 / December 1996*

## **Hidrovia Plans Propose Heavy Engineering for World's Largest Wetlands**

*by Glenn Switkes*

Newly released engineering studies and a draft environmental impact assessment (EIA) for the Paraguay-Paraná Hidrovia project propose heavy engineering works for the Pantanal, the world's largest wetlands. Project authorities have for months consistently denied that the Pantanal would be impacted by the project. However, the still-incomplete studies, released by project authorities on October 23, reveal that impacts from the proposed design could be great. The plan was strongly criticized by environmentalists and indigenous peoples in the La Plata river basin.

The Hidrovia project would alter the natural 3,400 kilometer course of South America's second largest river system to permit year-round navigation for large, multi-barge convoys. The new plan proposes dredging 233 sites along the river, including 154 in the Pantanal, where initially 13 million cubic meters would be dredged. The river's more sinuous curves would be straightened, and a canal constructed on one stretch. The cost estimates for engineering works and required maintenance over 20 years will be between US\$500 million and \$1 billion, according to official estimates.

The project's design and impact assessment studies are the result of nearly 18 months of work by the Intergovernmental Committee on the Hidrovia (CIH), which includes officials of Bolivia, Brazil, Paraguay, Argentina, and Uruguay. The studies were funded by the Inter-American Development Bank and the United Nations Development Programme (UNDP).

Critics of the Hidrovia point to the long-term impacts of similar navigation "improvements" on the Mississippi and Danube. Alterations of these rivers caused a multitude of unexpected problems, including increased sedimentation, erosion and flooding, which led to the need for further construction works. Major stretches of these once ecologically complex river systems have been reduced to little more than shipping canals. The Hidrovia engineers acknowledge that, over the long-term, dikes and additional structures will have to be built. Construction of a new port in the Pantanal is even proposed in the design.

The draft EIA states that up to 10 percent of the area of the Pantanal currently flooded during the dry season will no longer receive water, yet in an apparent contradiction estimates that only one percent of

the Pantanal will be lost. It also downplays the project's impacts on water quality and fish stocks, and rejects the possibility of increased downstream flooding. The EIA also fails to alleviate concerns of the impacts of huge convoys of barge trains passing through national parks and ecological reserves every 90 minutes during the peak of the soy harvest, and the attendant risks of oil and chemical spills from such traffic.

Critics also question the consultants' optimistic evaluation of the economic viability of the Hidrovia. The report by the engineering firms Hidroservice (Brazil) and Louis Berger International (US) failed to consider the impact on the Hidrovia of two other waterway projects being prioritized by the Brazilian government, the Madeira-Amazonas and Tocantins-Araguaia. Instead, it only looked at the Northern Railway (Feronorte), which is currently under construction, and while conceding it would provide cheaper transport than the Hidrovia, still, concluded the Hidrovia was economically viable.

The studies also found that indigenous peoples would be the most impacted by the project, losing income from fishing and agriculture and having their land base threatened by increased land speculation. Yet, project proponents have failed to provide information on the project in an appropriate form which would permit indigenous communities to decide how the project would affect them. The project plans to dredge and straighten the Paraguay in the section which passes the Guato reserve. "We'd have been better off being born as capybaras [an animal], because at least the forest police take care of them. No one cares about the Indians," says Severo, chief of the Guato people.

The Brazilian government, thought to be a key player in determining whether the Hidrovia moves ahead, had publicly stated that no work would be undertaken which would impact the Pantanal. But the Brazilian Foreign Ministry did not categorically exclude such operations, but instead said that Brazil would "prioritarily" avoid works which permanently damage the Pantanal.

"The Brazilian government has been playing a diplomatic game of fence-sitting throughout this entire process. It's time for them to get off the fence, and to play an active role in protecting the Pantanal, a planetary treasure, from the dangers the Hidrovia project represents," says Alcides Faria of the Brazilian nongovernmental organization Ecology and Action, a member organization in the Rios Vivos coalition.

The studies were originally intended to help the governments of the region decide on river alterations that would minimize damage to the environment. The environmental team, however, was hampered from the start by its limited access to the complete engineering design. In addition, project documents were not made available to the public in a timely manner. In a letter this week to the studies' funders, the Inter-American Development Bank and UNDP, local and international NGOs asked that the approval period for the studies be extended to allow time for independent analysis of their findings. The groups also urged that no engineering works be undertaken until the analyses are completed.

- See the [Hidrovia Campaign Page](#) for more information.
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# World Rivers Review

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## Piecing It Together

by Lori Pottinger

The stories you'll find in this end-of-year *World Rivers Review* portray a wide range of challenges facing the world's rivers today, on both sides of the "good news/bad news" spectrum. Taken as a whole, this issue is something of a crazy quilt, with pieces on everything from river-damaging dams and channelization proaches to river protection being used by a growing cast of river activists.

A number of stories told here are about channelization projects - projects proposed for various reasons but which would all result in major alterations to natural river systems. First, there's the ["river as highway" development scenario](#), represented by the Hidrovia navigation scheme and a [similar project proposed for the Elbe](#). In the first, five governments are conspiring to blast, dredge and otherwise alter South America's second largest river system to make way for huge multi-barge convoys along its 3,400-kilometer length. Much of the La Plata river basin is already navigable by single barges and smaller vessels, but bigger convoys bring in bigger profits. The promoters of the Hidrovia could learn a lesson from the eminently sensible message put forth by the Elbe's defenders: "Adapt ships to rivers and not rivers to ships." In light of their victory on the Elbe, NGOs intend to work to reform the European policy of altering rivers for large barges.

[Another channelization story herein](#) has as its premise the old adage that floods can and should be engineered away. Although using massive engineering works to prevent floods is an ill-conceived idea, it continues to be heralded by a team of proponents that includes engineers who have never met a river they couldn't tame, developers eager to plant houses in floodplains, and governments encumbered by both flood-prone constituents and flood-control bureaucrats. In Japan, a costly and destructive flood control proposal has remained on the official roster for 15 years and even draws a hefty annual budget, although public opposition to the project has prevented construction from starting. Opponents continue to push for alternatives that would protect the river and its interconnected ecosystems.

You'll find a [story about a dam project](#) that comes with a "because we're the daddies, that's why" attitude that typifies the planning of large development projects in many parts of the world. In most cases it begins with professional paternalism, in which engineers assume that lay people would hinder the efficient planning of technical projects such as dams. The attitude is then adopted by those building the project who, if they consider bringing in affected people into the planning process at all, usually do so

only after it's a "done deal." The financial institutions that fund large river schemes are particularly prone to such attitudes about public involvement, as the news about [German lending for China's Three Gorges Dam](#) reveals. It's not just the insiderism that is at issue here, but the fact that a government bent on obtaining contracts for its own national advancement could ignore the huge environmental and social problems this project will bring elsewhere on the planet. As a representative from a German NGO noted, if Germany can fund Three Gorges without a blink, it can fund anything.

A new feature starting in this issue looks at the [public relations campaigns that accompany river-development projects](#). The trend to wash over growing public criticism of such projects with slick brochures, movies and other materials reveals that river-development proponents have gotten the message that their schemes will create controversy - but that they haven't yet figured out *why* their projects are controversial. As promoters continue to master the bob-and-weave dance of "PR" to massage the public perception of such projects, river activists will need to learn to read between the lines and act accordingly.

Also in these pages you'll find two features on very different subjects that are linked only because they both look forward in some way. First, there's [an interview with an expert in the field of river restoration](#). Dr. Douglas Shields, who is helping to refine the fledgling science of large-scale river restoration, explains a bit about what restoration projects can and cannot accomplish. And a story about [the growing use of renewable energy in coal-dependent South Africa](#) offers hope for those who want both clean energy and healthy rivers.



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## **Important Victory on the Elbe River**

*by Roberto A. Epplé*

River activists in Europe have defeated a scheme of navigation dams proposed for the Elbe River, and convinced the German government to instead improve existing navigation channels, thus leaving the river unharmed.

The 1,091-kilometer-long Elbe River, which flows through the former no man's land that once separated East and West Germany, came out of the shadows with the reunification of the country in 1990. The river had been badly polluted by East Germany's heavy chemical industries (the huge "Kombinats" which disgraced the land), but the riparian ecosystem was surprisingly intact, because urbanization along the river was minimized by its status as a dangerous border zone. Consequently, large areas remained wild, supporting a rich flora and fauna and the largest stretch of flood plain forests remaining in Europe.

The Elbe is one of the longest rivers of Europe. Its source is in the Riesengebirge (the Giants' mountains) in a National Park in the Czech Republic. With Germany's reunification, interest rose in the forgotten river. First, the German government launched clean-up efforts. The building of 66 purification plants, combined with the demise of the Kombinat, has had excellent results: since 1989, organic pollution and pollution by phosphorus have been cut in half, while the level of nitrogen decreased by 25 percent and mercury dropped by 65 percent.

But despite these improvements, threats to the river were coming from other quarters. The federal Ministry of Transport planned a series of river-regulating dams and channels to facilitate navigation for wide-gauge barges, a plan which threatened the Elbe's ecological balance. In response, environmentalists from Germany and all over Europe came forward to defend the river. Opponents soon managed to reduce the proposed scheme to only one dam on the Saale River, a tributary of the Elbe, and to the strengthening of the "buhnen" (jetties) used to channelize the river for large barges.

But even this downgraded plan would have had radical consequences on the dynamics of the river's natural flow. Channelization accelerates the sinking of the riverbed, dries up precious floodplain forests, and adversely affects oxbow lakes and backwater habitats, which help prevent floods and maintain healthy water quality. So a proposal was devised that involves no new dams or channels. The principle was simple: "adapt ships to rivers and not rivers to ships." The plan involves improving existing canals

linking the Elbe to other rivers, including the Rhine, Weser, the Oder, the Havel river, and the Baltic Sea and North Sea.

Finally, on September 5, 1996, the four largest German NGOs and the Ministry of Transport came to an agreement: the Elbe river will be closed to all commercial traffic between Lauenburg (upstream from Hamburg) and Magdeburg as soon as existing canals are widened for wide-gauge ships. Part of this approximately 300-kilometer-long portion may be added to the existing 78km-long UNESCO Biosphere Reserve - the Mittlere Elbe Biosphere Reserve. Located around Dessau and Torgau, where American and Russian troops invaded Germany during World War II, the expanded Biosphere Reserve would become the longest protected section of river in the world.

The next step for environmentalists will be to protect this portion of the river, the upper Elbe. But the long-term objective is to change the European policy of enlarging rivers for wide-gauge barges. The Rhine and the Altmühl, once living rivers, have been turned into dead waterways from this policy, and French authorities now mean to do the same with the Doubs River to complete the Rhine-Rhône canal. However, this first victory on the Elbe, coupled with the strong opposition to the Rhine-Rhône canal, indicates strong support for protecting rivers from ill-conceived development projects. ERN's Living Rivers campaign will work to mobilize this support to oppose the European policy of creating wide-gauge inland waterways.

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## **Dam Site Becomes Danube National Park**

*by Roberto A. Epple*

Opponents of the proposed Hainburg Dam on the Danube River realized a dream on October 27, 1996. On this day, 10,000 hectares of riverine forest in the area of the canceled dam project officially became a national park, thus finally protecting the last large and ecologically intact middle-European riverine forest and all that depends on it.

More than eleven years before, opponents of the Hainburg hydroelectric power plant had symbolically declared the dam site a national park. Thousands of environmentalists came from all over the country to the site, east of Vienna near the Slovakian border, to prevent clear-cutting of the alluvial forest by using non-violent methods of resistance. The occupation of the dam site, as well as a court decision supporting project opponents, forced the Austrian government to formally give up the project in early 1985. But it took years of intensive efforts on the part of numerous NGOs to reach the realization of the national park. Until recently, the Austrian company Donaukraftwerke AG continued to present new dam proposals, never giving up on the idea of using the last undammed 20 percent of the Danube for hydropower. In Austria, the Danube is already blocked with nine hydropower plants.

The notion for a Danube national park arose from a 1989 campaign, started by WWF-Austria, to buy a 411-hectare section of riverine forest. The campaign raised US\$9 million to purchase the land, which became the seed that spawned a national park -p; and killed a dam.

Another stretch of the Danube was placed under protection in April. The Donau-Drau National Park, south of Budapest on the border to Croatia, should save about 20,000 hectares of riverine forest, upon which depend the severely threatened black stork and the sea eagle, the mightiest "greifvogel" of Europe.

NGOs are expanding to preserve other parts of the Danube system. The group Euronatur is especially active in pushing for a diversity of protection projects on Danube tributaries (including the Drau, Save and Mur) in Slovenia, Croatia and Serbia. And WWF's ongoing "Green Danube Campaign" is calling for the designation of more protected areas along the Danube. Five model projects will focus on the ecological restoration and protection of the Danube area. The main goals of the campaign are as follows: conservation of the floodplain forests, preservation of biodiversity, reduction of water pollution, and securing the safe supply of drinking water for 20 million people.



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## **Citizen's Work to Protect Chitose River**

*by Dr. Yugo Ono*

The Chitose River is a tributary of the Ishikari, the biggest river in Hokkaido, and the second longest river in Japan. The Ishikari had historically high floods in 1976 and '81. Damages exceeded 22 billion yen, and most of the alluvial lowland--primarily used for farming--was inundated. In response, a government agency has proposed an expensive "engineering fix" that would harm wetlands, fisheries and river-related habitat.

The drainage area of Chitose river is low-lying, especially between Chitose city and Ebetsu, situated at the confluence with the Ishikari. During floods, the Chitose cannot flow easily to join the main stream of the Ishikari, because the water level of the Ishikari becomes as high as that of the Chitose. Furthermore, because most of the Chitose's alluvial lowland is topographically lower than the water level of the Chitose during the flood, the area suffers inundation, caused by the rain water which cannot drain to the river.

Just after the 1981 flood, the Hokkaido Development Agency planned the "Chitose Diversion Channel Project." This project proposes digging a new channel 38km long and 200-400m wide, between the middle reach of the Chitose south to the Pacific coast; and construction of three gates to control the river's flow. During flood conditions, gates will force the Chitose's waters to flow down into the diversion channel to the Pacific Ocean, thus reversing the river's natural direction. The channel project - the biggest river development scheme now proposed in Japan - would cost 480 billion yen (US\$48 billion) and take 20 years to complete.

The channel was first proposed to the River Management Advisory Council of the Ministry of Construction in 1982 by the Hokkaido Development Agency. The council decided very rapidly to support the project, despite the fact that there had been no representation in the deliberations by local governments, citizens, NGOs, or specialists in ecology, economy or other social sciences. A strong movement against the project arose soon after it was unexpectedly presented to the public.

The movement against the diversion channel involves not only local people, but also many environmental NGOs. The movement grew and became stronger, helping to postpone the project for more than 13 years. Despite growing opposition to the project, it continues to receive a budget of more

than two billion yen every year. The money is for obtaining land for the diversion channel, but public outcry has prevented the agency from actually purchasing any land. As a result, the Hokkaido Development Agency has used this enormous budget only for research and propaganda supporting the project. Beautifully printed color explanation booklets were distributed to the inhabitants of the drainage area of the Chitose, to help convince them that this project is the only way to avoid future floods.

### **Less Destructive Alternatives**

Japanese NGOs have proposed many alternatives to this destructive project, including widening the channel of the Ishikari, constructing a stream separating embankments between the Ishikari and the Chitose at the junction, and enlarging flood retaining ponds in the Chitose floodplain. Although they do not provide the same level of flood control as the Chitose Diversion Channel, these alternatives have many positive aspects. Unlike the diversion channel, they have minimal environmental impacts, especially to Lake Utonai, the fourth site in Japan to be designated under the Ramsar Convention as a wetlands of international importance.

Lake Utonai is located very near the planned route of the Chitose Diversion Channel, and would suffer damaging hydrological changes if the channel were built. Since the Chitose Diversion Channel will cut deeply into the ground surface, all ground water that nourishes Lake Utonai would seep to the diversion channel instead. This ground water comes to the surface in a small valley dissecting the volcanic plateau, through many beautiful springs. The spring waters join together and soon become the Bibi River which flow into the Lake Utonai. The construction of the Chitose Diversion Channel would cut completely the ground water flow which nourishes many springs of the Bibi and Lake Utonai.

On the occasion of the fifth Ramsar Conference at Kushiro, held in Hokkaido in 1993, the government of Japan promised that it would take steps to protect Lake Utonai. However, even after three years, the Hokkaido Development Agency has not presented any from the problems caused by the diversion channel. The agency proposed only unrealistic means to conserve the ground water. Their plan involves constructing an 12km-long underground wall to block the ground water flowing from the hills to the Diversion Channel, and a pumping system that would need to work eternally, 24-hours a day, to pump groundwater up and over the channel to replenish the water of the Bibi River.

The channel will affect not only the Ramsar site, but also the offshore environment. By directing flood waters containing silt and suspended material to the Pacific Ocean rather than to the river's floodplain, the channel could cause serious damage to aquaculture (scallops and other mollusks) and off-shore fishing in the region. Following strong protests by fishers' associations, the Governor of Hokkaido Prefecture declared that he would not approve the start of construction of the Chitose Diversion Channel, unless Hokkaido Development Agency presents effective measures to avoid such damage to fisheries.

But as with the problem of ground water flows, the Hokkaido Development Agency has not yet presented any effective proposal to solve this problem. The situation clearly demonstrates that it is impossible, with present technology, to avoid fisheries damage caused by flood-water flushing. But the Hokkaido Development Agency still insists on the construction of the Chitose Diversion Channel, and is trying to persuade the fishermen by giving them money.

## Ingrained System

Why does the Hokkaido Development Agency insist on pursuing this project? The answer lies in part because this project has already been approved by the Ministry of Construction. In Japan, once a project has been approved and authorized by the Ministry, it is very difficult to stop or change it. This damaging and illogical tradition has already been revealed in the case of the Nagara River Estuary Dam and many other dams in Japan.

The only argument for the Chitose Diversion Channel over other alternatives is based on the supposed value of standard flood discharge of the Ishikari, which was determined secretly by the River Management Advisory Council in 1982. In that committee, the Hokkaido Development Agency proposed 18,000 m<sup>3</sup>/sec for the standard flood discharge amount. But this value is much higher than the peak discharge experienced even in the two historical floods of 1976 and 1981. The peak discharge in the 1976 flood was 7,700m<sup>3</sup> after three days' continuous rain, and 12,000m<sup>3</sup> in 1981, after three days' rain.

After increased demands for information disclosure, the Hokkaido Development Agency recently revealed the process by which they determined this high value. A computer simulation produced seven different values, ranging from 12,000 m<sup>3</sup>/sec to 18,000 m<sup>3</sup>/sec. They chose 18,000 m<sup>3</sup>/sec, merely because it is the highest value. This demonstrated clearly that they never checked any environmental and social impacts resulting from the choice of this high value for the standard flood discharge. If the value was a mere 1,000 m<sup>3</sup>/sec less than the highest simulation value, the Chitose Diversion Channel becomes unnecessary, since it evacuates only a flood discharge of 1,000 m<sup>3</sup>/sec to the Pacific Ocean.

It is true that the drainage area of the lower reach of the Chitose needs flood management. But even if it can reduce flood damage from the Chitose better than other alternatives, the Chitose Diversion Channel is not a good plan. It causes too many serious environmental problems, which cannot be solved with present technology. But most importantly, it was determined in secret, completely hidden from the local people. This is unjustifiable for such a large public works project.

Fortunately, the construction of this project has been stopped for now by the opposition movement, which continues in its efforts to stop the channel from being built. The movement is working to change the system of how river public works projects are approved in Japan.

Yugo Ono is a professor at the Graduate School of Environmental Earth Science at Hokkaido University.



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## **Japanese Groups Call for New River Philosophy**

In September, the Diet Members' Association for a Mechanism of Public Works Review (DAMPWR) and the Nagara River Inspection Committee sponsored a "dam summit" in Nagarakawa, Japan. The "International Conference on Creating a Vision of Rivers for the Twenty-first Century," led to the adoption of a far-reaching declaration on protecting rivers from destructive development, both in Japan and around the world.

While acknowledging that "dams had as their nominal purpose the promotion of economic growth and more convenient human livelihoods," the declaration states that "a new river philosophy . . . is needed" - one that would respect the "cycles of materials--water, sediments, and living things--in rivers." It calls for the conservation and restoration of inland and coastal wetlands, the preservation of river-connected cultures, and a flood management approach that would favor preventative reforestation and retention ponds over engineering structures. But perhaps the most radical proposal is this: "The central role in river management should be taken by residents living along rivers, with technicians and engineers serving as their advisors."

Specific recommendations for Japan include creating a sustainable management plan for wetlands, forests, rivers and seashores; increased emphasis on river restoration; and appropriate land-use planning to avoid concentrations of economic activities and populations that exceed the natural capacities of their watersheds. The group also called for the suspension of all proposed large-scale dam, barrage and other construction projects until they can be reviewed for adherence to the other principles outlined in the resolution. In closing, the declaration states that "the issues presented here in relation to Japan should apply as well with respect to river management activities undertaken overseas, such as through Japan's Official Development Assistance (foreign aid)."

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## **Emergency Authorization Granted for Brazilian Dam**

*by Glenn Switkes*

Short-circuiting environmental licensing procedures, the Brazilian Congress granted emergency authorization to close the floodgates on Serra da Mesa Dam. Thus, on October 25, the reservoir of the last of the "dinosaur" dams dating from the era of the military regime began to fill.

The 154-meter-high Serra da Mesa still has no final environmental impact assessment, nor a federal environmental license. In October, a federal judge in Tocantins state, which will suffer serious environmental impacts from the dam, issued a temporary restraining order, but this was overturned by a federal judge in Brasília, on the grounds that to hold up the dam's operation would further jeopardize the privatization of the financially shaky Nacional Energética, which holds majority interests in the dam.

Timber in the reservoir area was not cleared, which will affect water quality. Also harmed by the dam will be 1,200 recorded plant species, 92 species of mammals including the endangered giant anteater and spotted jaguar, 36 amphibian species, 73 reptile species, and 228 bird species. Also to be flooded are 91 pre-historic archaeological sites up to 10,000 years old and 203 identified sites from the colonial period, as well as recently-discovered mineral reserves of gold, niobium, tin, lead, zinc, and manganese.

The federal public defender for Tocantins state, Marío Lúcio de Avelar, visited the dam site two weeks after the gates were closed, and verified that no water was being released from the dam to maintain the river ecosystem. He also noted that the site was not cleared of vegetation, and that timber valued at US \$115 million was left to rot beneath the reservoir. "Among the improprieties on this project are crimes against nature, a false and authoritarian licensing process, and a lack of the necessary environmental impact study," said de Avelar.

Measuring 54.4 cubic kilometers of water, Serra da Mesa will become Brazil's largest lake in volume. Though generating only 1,293 megawatts of electricity at its peak production, the dam, built at a cost of US\$1.1 billion, will flood 1,784 square kilometers - thirty percent larger than that of Brazil's giant Itaipu Dam, which generates 10 times more energy.

As the reservoir fills over the next 18 months, the Tocantins River - a major tributary of the Amazon - will dry to a trickle for more than 40 kilometers below the dam, killing fish downstream and changing

the river's ecosystems. Thousands of gold miners have begun arriving to seek their fortune in the nearly dry riverbed, and are expected to leave behind an environmental nightmare.

Last-minute challenges by environmentalists and human rights advocates focused on the fact that the dam will flood 10 percent of the reserve of the Avá-Canoeiro, an indigenous group which, under the constitution, should have been consulted before the dam was built. It appears that because only a few nomadic bands of the Avá-Canoeiro actually live in the area flooded by the reservoir, the constitutional requirements were waived.

In compensation, the electrical utility FURNAS has promised to increase the size of the indigenous reserve, and to provide them with a royalty, equivalent to \$100 for every \$1 million the company earns as a result of the project. Some 4,300 agriculturists who will be relocated have complained that compensation they have received from FURNAS is inadequate to meet the costs of moving and buying new land.



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## The Fine Art of Selling a Dam

by Lori Pottinger

We've been noticing lately that advertisements and brochures for large river-development schemes are getting slicker - and, one might add, sicker, with their propensity to twist facts and reach startling conclusions about the benefits of some very destructive projects. But two new calendars and a "commemorative journal," produced for the tenth anniversary of the multi-dam Lesotho Highlands Water Project in Southern Africa, should get some kind of award for overblown salesmanship. Thus, with this issue we introduce a new semi-regular feature on the growing trend in the river-development industry to counteract criticism of projects with "PR" - public relations.

"Greenwashing" is now a fairly well-documented phenomenon. It refers to creating an environment-friendly image for a company whose work is inherently environmentally destructive, such as large-scale logging or oil extraction. A new twist on greenwashing is to use cunning PR to promote a project's social benefits - a tactic that is becoming increasingly popular with dam-builders, who often face stinging criticism for their projects' social impacts. It's a practice that is every bit as insidious and cynical as its "green" counterpart. We will keep an eye of both forms of "false advertising" in this column. The package of materials promoting the Lesotho Highlands Water Project (LHWP) was the PR-shot heard round the world in the NGO community. "Did you get the calendars yet?" was the message from colleagues in earlier time zones. "It's unbelievable."

The expensively printed calendars feature inspiring quotes next to photos of typical Lesotho Highlands scenes, where the first of five dams has affected the lives of some 20,000 people. "We hope these diary pictures will let you share what the LHDA's Environmental Action Plan means to the people of the Highlands," writes the Chief Executive of LHDA.

Even if you assume a completely innocent motivation for this PR--if you assume only that the materials represent pride of accomplishment on the part of project authorities--the quotes in the calendar are sadly ironic in the context of this project:

- "When tillage begins, the other arts follow," the page for the month of June solemnly states. "The farmers, therefore, are the founders of civilization." *Reality check:* The LHWP will consume some 11,000 hectares of grazing and arable land if the entire project is built, including some of the Highlands' best farmlands. Because Lesotho has so little arable land, those displaced have not been given replacement farmland, and will instead be forced to seek new livelihoods.

- The quote for January: "He that hath a trade hath an estate, and he that hath a calling hath an office of profit and honour." In fact, the project's retraining program for affected people has mostly been a failure. Because the retraining is still in the pilot-project phase, affected people are supplied with bags of maize in compensation for lands taken by the project. A person who lost land to Katse Dam told *WRR*, "The project has not kept its big promise to us--that we would have new work."
- "Sustainable development emphasises participation by communities - not imposing projects on them," is the lofty quote accompanying a photo of (presumably local) men digging pits for latrines. Apparently, doing menial labor on this project equals community participation, because other than a few jobs, there has been precious little local participation to date. Sorry, but the new public participation process being tried for the upcoming Mohale Dam hardly justifies including this pretentious sentiment.
- This Biblical quote appeared next to a photo of a boatload of men crossing Katse Reservoir: "All rivers flow into the sea, yet the sea is not full; into the place from which the rivers came, there they return again." Did we mention that Katse Dam, Africa's highest, will divert Lesotho's water to a South African dam? Maybe we shouldn't be so literal, but it seems that this river won't be flowing to the sea or returning to the place it came from.

It's not just the great expense of creating and distributing this pile of puffery that we find distressing. Using PR to mask the serious criticisms of this project is akin to a doctor prescribing aspirin for a brain tumor. It ignores the roots causes of the problem, and in so doing deems them unimportant.

The impetus for these materials apparently comes from the World Bank, which helped finance the first dam in the five-dam project and is currently deciding whether to help fund a second. Faced with mounting public criticism of the project, the Bank began consulting with project authorities on its public relations in March 1995. A June 1996 Aide Memoire noted that "This year will be critical for the LHWP and for its future success. The tenth anniversary provides the framework for a successful PR campaign." The point of the campaign, the memoire notes, is to mobilize support for the LHWP and "particularly for the financing and implementation of Phase 1B," the second dam to be built. The memoire listed the budget for the first year of the public relations and information program as 5.69 million rand (about US \$1.21 million).

With that kind of cash, the PR Patrol won't be without work any time soon.

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### For more information:

- [World Rivers Review, June 1997](#): "Defending Dam PR". A response from LHDA.
  - See the [Southern Africa Campaigns Page](#) and the [International Finance Campaign Page](#) for more information.
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# World Rivers Review

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## A River Restoration Primer

An Interview with Doug Shields

*Douglas Shields is an expert on river and stream restoration and a research hydraulic engineer at the US Department of Agriculture's National Sedimentation Laboratory. His new book, River Channel Restoration (John Wiley & Sons, UK, 1996), is a practical guide for river managers on the latest approaches to restoration. He also co-authored, with James Gore, "Can Large Rivers Be Restored?" (BioScience Vol. 45, #3, March 1995). The authors' conclusions in this article described some of the difficulties inherent to restoration, while also noting that it may be our biggest hope, given the extent of ecological damage to the world's rivers. "When considering the range of disturbances that have occurred in the watersheds that contribute to the structure of large river ecosystems, and the alterations of large rivers themselves to suit the needs of navigation and land development, the task of truly restoring large river ecosystems is a daunting, if not impossible one. . . . Proposals and concepts for large river restoration are much more abundant than are demonstrations. . . . The challenge that awaits those who value rivers is to address this imbalance while protecting large rivers from further degradation." Here, we talk with Dr. Shields about his experiences with river restoration.*

**WRR: You have written, "When considering the range of disturbances that have occurred in the watersheds of large river ecosystems, and the alterations of large rivers themselves to suit the needs of navigation and land development, the task of truly restoring large river ecosystems is a daunting if not impossible one." In your work on river restoration, what kind of ecological functions or values can be restored?**

DS: Because of the way we've developed and used river systems, I'd have to say that restoring the floodplain ecosystem is the most difficult. River floodplain habitat is dynamic: the river migrates, overflows, etc. If we confine a river with "river training" structures such as levees, and then develop the river's natural floodplain for agriculture, industry, etc., that can be a practically irreversible situation. It is inconceivable in most cases to find enough money to move all the people in a floodplain once it has been developed, meaning it is virtually not possible to re-establish the natural floodplain. In cases where floodplains have been developed for agriculture, but support few buildings and other types of infrastructure, partial restoration can be achieved by breaching levees or changing reservoir operations to release more natural, higher flows for short periods.

The most attainable restoration goals include modifying aquatic habitat, changing the shape of a channel or changing the way we regulate a stream. We can do things inside the active flow channel more easily than out on the floodplain itself.

Advancing the state of the art is a slow process, but as we understand the physics of sediment transport better, we will do a better job of managing rivers. Even 25-30 years ago, there was little research on rivers as conduits for sediment--it all focused on the water. About two-thirds of our research energy needs to go into sediment transport. Computers are helping. We're learning how to modify dam water-release strategies to maintain gravel spawning grounds and sandbed habitats.

A good example of what happens when you undertake major river modification without considering sediment transport is the Lower Mississippi River. In the past 60 years, we've shortened the Mississippi's reach by 30 percent with man-made bend-cutoffs--channel straightening. The purpose of these cutoffs was to lower flood stages, and in their design, much consideration was given to the conveyance of water, but very little to sediment. Much evidence suggests that costs for maintaining the navigation channel in the river were increased by the accelerated erosion and sedimentation that followed the cutoffs. Channel straightening has caused lots of problems all over the world. Studies of Goodwin Creek, a small straightened stream in Northern Mississippi, indicate that the stream carries a very high sediment load, and that 85 percent of this sediment comes from erosion of the channel bed and banks.

**WRR: Are there kinds of rivers that can be more easily restored?**

DS: Ecosystems tend to be more resilient near the equators and less so nearer the poles. There are exceptions, but that's something to pay heed to. I've also always felt that rivers which lack "bedrock control"--in other words, truly alluvial rivers--are the most vulnerable, because they can more easily get out of balance and destabilize. Braided rivers--like the Missouri--cause more problems when we engineer them, partially because of their high sediment loads. They are naturally more dynamic and move around a lot more. We tend to try to fix rivers in place, so we can build around the engineered river. Also, there's no question that size makes a difference: we've been able to "rough up" smaller streams more easily. Many of the very smallest streams in urban areas are now completely controlled by culverts.

If we define restoration as full or partial return to conditions of predisturbance, then all restoration efforts should focus on the watershed. The physical system is the foundation for a healthy river--you can't build a superstructure without an adequate foundation. Disturbed watersheds deliver more water or sediment to stream habitats. Restoration of these habitats will do little over the long run if watershed conditions are not addressed or at least considered. Most of my research has dealt with in-channel treatments; sometimes, the best you can do is work on the symptoms.

**WRR: What are the biggest stumbling blocks in river restoration work?**

DS: There are a lot of them. In this country, the biggest one is probably the difficulty of reclaiming developed floodplains. Along the Sacramento River in California, for example, if we could just set back the flood-control levees 100 meters and put in better-engineered ones, that would be marvelous. The existing levees were built a very long time ago using sandy soils and very crude designs. Along much of

the river, these levees are at the water's edge, leaving little room for natural habitat. Improved, set-back levees made of better soils would really increase the reliability and safety of the flood-control system, and the quantity and quality of riparian habitats would benefit, too.

When developing a large river, we usually eliminate low-velocity habitat areas contiguous to the main channel, which means we lose physical diversity. The deeper, swifter habitat types become more common. It is very difficult to recreate these off-channel, low-velocity habitats, once the damage is done. More pristine rivers continually convert these quiet backwater habitats into terrestrial habitat through sediment deposition, but they also create new backwaters through channel migration processes.

There are probably also a number of insidious water quality problems caused by changes to riparian ecosystems that we don't even recognize yet. They may already be affecting our biological communities.

**WRR: Why should the average citizen care about river restoration?**

DS: My kneejerk reaction is, if you do not have any kind of affinity for rivers, you're in need of more help than I can give you. To be less childish, I would say: In the US at least, we are now spending very healthy sums on streams and rivers at all levels of government. Citizens need to be informed about how these funds are being directed. I also think we should view our streams and rivers as a national resource, like we do our national parks and forests. These systems are great harbors of biodiversity, and are also crucial for water quality and human health, among other things. The real challenge to engineers and scientists is, as we garner more public support for this work, will we know what to do?

One of my soapbox issues is that I think we err when we focus on the requirements of a single species. We really need an "Endangered Habitat Act," not an "Endangered Species Act." Let's restore the physical and hydrological functions of our waterways and then let mother nature decide what species should return.



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# World Rivers Review

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## Bringing Rivers Back from the Brink

by Aleta Brown

Because large-scale river restoration is still in its infancy, it remains to be seen whether badly damaged river ecosystems can ever truly be "restored" to their original conditions. Restoration work can also be expensive, and its costs have never been calculated into the budget for a damaging river-development scheme. But as Dr. Shields notes in the accompanying interview, the budding science of restoration may be our best hope for bringing rivers back to health. Here, then, are a few "works in progress" to restore large rivers.

The **Rhine River** was pronounced dead in 1970, its animal and plant life extinguished. In 1986 a fire in a Swiss chemical factory spewed toxic chemicals into the river, prompting a drinking-water alert for 50 million people. In 1987, five Rhine countries created the International Commission for the Protection of the Rhine, which called for cutting pollution in half, establishing a riverwide alert system, and restoring the Rhine's flora and fauna.

Today, most of these goals have been met. Heavy metals and dioxins have been cut by 50-70 percent and improvements in water treatment plants have made the water potable. Last November, salmon and trout were spotted in the upper Rhine for the first time in 50 years.

For millions of years, the **Platte River** in Nebraska has served as a rest stop for migrating sandhill cranes and many other species of birds. In modern times, dams and diversions threatened to dry up this rich habitat.

In 1978, the National Wildlife Federation and the State of Nebraska won a \$7.5 million lawsuit against dam builders. The award was used to create a trust which purchases and restores river channels, riparian habitat and surrounding wetlands to ensure the river's wildlife heritage. To date, the trust has purchased 8,000 acres of land (out of a targeted 25,000), including 16.5 miles of river frontage, and is currently restoring wetlands and meadow habitat along the river.

The **Volga River** - which supports 40 percent of Russia's population, 45 percent of the country's agriculture and half its industry - had become the nation's sewer as well. The pollution was intensified

by a series of eight large hydroelectric dams, which hampered the river's ability to purify itself. As a result, just a fraction of the river's water is fit for human consumption. The Volga Revival Programme, only now in its early stages, calls for strict ecological regulations on the industries most responsible for polluting the river with their waste discharges. The Programme is likely to cost US\$62 billion, the majority of which is expected to come from industrial users of the river.

In response to a series of devastating floods, the **Kissimmee River** in central Florida was channelized by the Army Corps of Engineers in the 1960s. The 104-mile-long braided river was squeezed into a 56-mile canal, which dramatically altered riverine ecosystems and led to drastic declines in wintering waterfowl, wading bird and fish populations. The \$415 million Kissimmee River restoration project seeks to undo some of these impacts. In 1994 the Army Corps began restoration of 1,000 feet of canal and implementation of the complete plan calls for restoration of 22 continuous miles of canal. The upper and lower third will remain channelized, to protect existing housing developments and to maintain existing levels of flood control.

The **Murray-Darling River Basin** in Australia is in ill health due to overallocation of its waters, agricultural pollution and other problems. The basin now experiences drought-level flows every 3 to 4 years, compared to every 20 years under natural conditions. The Murray-Darling 2001 Project, with a price tag of AU\$300 million, aims to improve water quality by reducing salts and nutrients in the river, and restore riparian systems, floodplains and wetlands with increased flows.



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# World Rivers Review

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## Coal-Fired South Africa Makes Room for Renewable Energy

*Some policy analysts argue that opposition to large hydroelectric projects could set off a "coal rush," as governments and power companies opt for the cheap, abundant fossil fuel to provide power. But in many parts of the world, small-scale renewable energy technologies offer a realistic third path. **Jamal Gore**, Director of the Washington, DC-based Renewable Energy for African Development (REFAD), describes opportunities for renewable energy in South Africa, one of the most coal-dependent countries on earth.*

At first glance, South Africa would hardly seem to be a hotbed of renewable energy activity. The country has the seventh largest coal reserves in the world, enough to meet its energy needs for centuries. Eighty-nine percent of South Africa's electricity comes from coal, a figure exceeded only by China, and ESKOM, the national utility, produces some of the cheapest electric power on earth from these coal-fired plants. Of the electricity not produced by coal, two thirds comes from nuclear power plants and oil-fired generators.

But upon closer inspection, South Africa may be one of the world's great hopes for renewable energy. The new government has taken a number of steps to encourage renewable energy, and is working to spread not just the use of the technology but also to build local capacity in designing, installing, and servicing such systems. If numerous pilot projects and preliminary forays into renewable energy turn out well, South Africa could become a leader in promoting these technologies on a large scale.

### **The Fossil Fuel Dinosaur**

Coal-fired electricity is cheap in part because the environmental damage it causes is not factored into the cost of power. But the cost of extending the grid to new rural customers cannot be hidden under the rug - it must be paid for up front. Getting grid-delivered electricity to the estimated 10 million South Africans currently without power - a rural population scattered across 1.2 million square kilometers - would be prohibitively costly. Employees at the US Department of Energy estimate that it would cost about US \$11,000 per kilometer to extend power lines across inexpensive land with no hills or obstacles, not including the actual cost of connection to individual houses. South Africa's Energy and Development Research Center estimates connection costs in some rural areas at over \$1,000 per household. To complicate things further, most of these households are very poor and use so little electricity that at current rates the utility would not even be able cover operating costs for its power plants, let alone the capital costs.

Because the South African government has made a pledge to electrify more than 2.5 million households by the turn of the century, new approaches are needed to meet energy demand. Both the Government of South Africa and the national utility are increasingly turning to renewables to meet this enormous need. To start, the energy ministry has earmarked funds for the electrification of 16,400 rural schools and 2,000 rural clinics by 2005, using 500-watt solar systems. For the schools this is enough power for a projector, laptop computer, television, tape player, and lights for nighttime study and community meetings. For the clinics it will power high quality lights, a vaccine refrigerator, and lighting for a doctor's or nurse's residence. In addition, in late 1995 the government created a new non-profit organization, Renewable Energy for South Africa (REFSA), and charged it with finding ways to bring affordable energy services to rural homes that are beyond the reach of the electric grid.

With support from the US Agency for International Development, REFAD is working with REFSA to develop a local level credit program that will help rural households and village cooperatives purchase renewable energy systems. A typical household solar system in South Africa might cost \$600; with payments spread out over several years, the systems may cost less per month than the batteries, candles, and kerosene currently used for lights and radio. Even in those places where utility-scale power systems are called for, the government is considering building high-tech solar "power towers, which use thousands of mirrors to focus the sun's heat to produce steam, generating large amounts of power with no pollution.

## **Renewable-Ready**

Renewable energy technologies make use of resources that are bountiful, inexhaustible, and affordable (or even free, after installation costs) for poor households. South Africa and its neighboring countries have perhaps the best solar energy resource in the world, averaging over 4.5 kWh/m<sup>2</sup> per day. This makes it the perfect place for solar water heating and photovoltaic (solar electric) power. The country has strong steady winds along its coasts, enough to produce an estimated 1.9 gigawatts of power, and its agricultural industry produces plentiful inputs for biomass power generators. A number of farms and towns are using small hydropower stations to produce power. These technologies avoid the high transmission costs faced by traditional power plants because they can be sited in a village, or even on the roof of a house for small solar and wind systems. What is more, these household and village scale renewable energy technologies avoid the harmful environmental effects of burning coal or oil to produce power.

An added benefit of renewable energy in South Africa is that it helps to empower the historically disenfranchised black population. South Africa's new energy minister Penuell Maduna has stated that he wants to ensure that the black majority had the technical know-how to work with the newest technologies. At the same time, it must be kept in mind that only one percent of black first graders in South Africa currently graduate from secondary school. While the design, construction, and maintenance of a large coal-fired or nuclear power plant requires advanced degrees and specialized knowledge currently beyond the reach of most South African blacks, the corresponding skills for renewable energy technologies can be taught at the local technical and vocational schools that dot South Africa.

To help further the goal of building local capacity in new energy technologies, REFAD, with support from the US Department of Energy, is helping instructors from South Africa's Historically

Disadvantaged Institutions develop renewable energy courses and training centers throughout the country. This year, 32 instructors from 15 schools serving disadvantaged populations took part in the REFAD "Train the Trainers" program, and many are already building labs and teaching courses in renewable energy installation. The government and national utility have begun talks to have these instructors train the technicians needed for the national schools, clinics, and household electrification programs.

## Looking Ahead

At the September 1996 World Solar Summit in Zimbabwe, representatives from governments from all parts of the world pledged to support the increased use of renewables to kick off the World Solar Decade. At the same time, a group of NGOs were meeting in a side room to explore ways to hold governments to these promises and to ensure that renewable energy reaches those most in need. Groups were keen to learn from the early leadership shown in countries like South Africa and Zimbabwe, and to apply the lessons being learned in those countries to pursue renewable energy projects more aggressively in both developing and industrialized nations.

Each step forward with renewables is not only a step away from coal, but one that helps bring these technologies closer to large-scale use. This progress comes not a moment too soon. In many places around the world environmental degradation from coal mining and burning is so extreme that no new coal-fired power plant construction is allowed. At the same time, China and India plan to base most of their economic growth for the next century on coal, threatening efforts to combat global climate change. South Africa and its neighbors offer hope that there is room for renewable energy in a coal-fired world.

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## **New Site Recommended for Epupa Dam**

*by Lori Pottinger*

Project planners for Namibia's Epupa Hydroelectric Project recently revealed that they are recommending further study of new sites for the proposed dam - ones they say would have fewer environmental and social impacts than the original Epupa Falls site. The original proposal has been highly controversial both within Namibia and internationally because of the impacts it would have on the Himba people who live around Epupa Falls, as well as the inundation of the falls and surrounding oasis.

The news that new sites are being seriously considered was revealed at a public hearing on the project, held October 31 in Namibia's capital city of Windhoek. Information distributed at the meeting noted that "the question of whether or not to construct a hydroelectric plant in the Epupa Region will be addressed as a portion of the Feasibility Study Report which is scheduled to be completed in July 1997." The US\$7 million feasibility study is being financed by the Norwegian Agency for Development Cooperation (NORAD) and the Swedish International Development Agency (SIDA). Both are government agencies that have subsidized many dams overseas.

The two new sites to be studied in addition to the one at Epupa Falls are "Scheme B," which would inundate 382 square kilometers, displace 700 people and require a 161-meter-high dam; and "Scheme E," which would inundate 49 sq. km., displace 100 people and require a 203-meter-high dam. Both would have an installed capacity of 200 megawatts, and are estimated to cost somewhat less to build than the original proposal. According to the consultants, "E" would leave Epupa Falls undisturbed, and would be less favorable for disease vectors compared to the other sites.

"Site E would have the lowest environmental and social impact, but would be the tallest dam in Africa," said Barbara Belding of US Agency for International Development - Namibia, who attended the hearings. "Whichever site is chosen, the impact on the Himba will be enormous."

At the public hearing, Himba headman Hikuminue Kapika and two dozen others from the community that would be disrupted by the dam asked the government to abandon the project. Kapika was quoted in *The Namibian* as saying, "We object to these plans. We do not want this dam to be built. This area is the life of the people, of all the people who were born in the area."

The Himba also questioned why decisions regarding their lives were being discussed in Windhoek. "The public meetings concerning Epupa should be held with the people of the Epupa area," Kapika said.

Site E is some 40 kilometers downstream from the falls in the Baynes mountains. For all its improvements over the original site, it would have some increased impacts resulting from extending the project road an additional 40 kilometers into previously roadless lands.

An additional controversial aspect to the project is its location near the border with Angola. "In the past such schemes have led to serious problems," notes an October 28 article in *The Windhoek Advertiser*. "There can be no guarantee (particularly in volatile Africa) that Namibia will always be on friendly terms with her northern neighbor, Angola." The article listed Ruacana in Angola and Cahora Bassa in Mozambique as examples of hydroelectric dams that were sabotaged during recent conflicts. Ruacana, upriver from the proposed Epupa dam, runs at about 25 percent of capacity in part due to drought and in part from damage incurred during Angola's civil war.

Although the Epupa project is considered too controversial for many lenders, a high-level official who asked to remain anonymous said there are some surprising sources of support for the project: "Lurking in the wings are the Malaysians and the Chinese, neither known for their adherence nor concern for sound environmental procedures. And the President of Namibia has just been to the Far East, including Malaysia."

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- See the [Southern Africa Campaigns Page](#) for more information.



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## News Briefs

### UPDATES

**LESOTHO:** Work has resumed on the Lesotho Highlands Water Project (LHWP), after being halted for a mid-September labor crisis that resulted in at least five Lesotho Highlands Water Project workers being killed and many more injured. The incident, which began with a mid-September strike by workers on the 'Muela hydropower project, turned violent after the contractors managing the project fired all 2,300 striking workers and called police to evict them from the project site. On September 14, the police used tear gas to remove the workers, then shot them as they fled. At least 600 workers sought refuge in a nearby Catholic mission, where they remained for days. As of early November, some workers were reportedly still in the mission.

The World Bank, which is a lender on the massive multi-dam scheme and is monitoring the project's social and environmental impacts, reports that an agreement was struck between a local construction workers' union and the contractor on October 2. The key points include the reinstatement of up to 1,700 of the 2,300 dismissed workers, with the remaining workers receiving full termination benefits (declining work requirements on 'Muela prevent all from being rehired), and a new "recognition agreement" between the contractor and the union, CAWULE. The contractor had terminated the agreement with CAWULE in June 1995, which greatly increased tensions between workers and management.

The government of Lesotho is conducting an internal inquiry into the events, but NGOs have criticized it for its lack of impartiality. The inquiry team includes representatives of the police but not of the workers. Some critics have also noted that the scale of the LHWP - the largest infrastructure project under construction in Africa - may be beyond Lesotho's abilities to manage. The five-dam, US\$8 billion scheme is being built to transfer water to South Africa's industrial Gauteng province.

- See the [Southern Africa Campaigns Page](#) for more information on the LHWP

**MALAYSIA:** On October 3, the Bakun Hydroelectric Corporation signed a US\$5.4 billion contract to build the Bakun Dam with an international consortium led by Swiss-Swedish multinational Asea Brown



Boveri (ABB) and CBPO, a subsidiary of Brazilian construction giant Odebrecht. Environmental and human rights groups around the world have strongly protested ABB's involvement in Bakun, noting how this contradicts the company's claims that it offers "leadership in promoting environmental responsibility." Despite a stated commitment to "an open discussion of the issue", ABB refused to accept a memorandum delivered to the company by a coalition of Malaysian groups opposed to Bakun.

ABB-CBPO's expectations of profiting from Bakun, however, still face sizeable hurdles. A major one is that the project's financing has yet to be secured and investors appear extremely wary of the project. Official statements on the terms under which Bakun will be financed have been inconsistent and contradictory. At first 80 percent of the money for the project was to be raised through loans from commercial banks (debt finance), leaving the remaining 20 per cent to be raised by issuing shares in Bakun Hydroelectric Corporation (equity finance). By July 1996, this had changed to a 60-40 ratio, and more recently, it was announced that project would be funded entirely through selling shares in BHEC. Funding a massive infrastructure project solely through equity is extremely unusual as debt financing is cheaper to service. A 100 percent equity financing structure implies that would-be lenders have indicated they consider the project unduly risky. The listing of BHEC shares on the Kuala Lumpur stock exchange has now been delayed several times.

Investor nervousness about the economic viability of the project was well illustrated in mid-October when the Malaysia power utility TNB cut its prospective stake in BHEC from 25 percent to 5 percent. The value of TNB's shares rose nearly 6 percent after the cut was announced. Less than two weeks later the Malaysia Mining Corporation (MMC) announced that it would withdraw from its prospective 5 percent stake in BHEC. This stake has now reverted to the Malaysian government. It now looks increasingly likely that -- as opponents have long claimed -- Bakun can only be built if it is directly subsidized by Malaysian taxpayers.

- See the [Bakun Campaign Page](#) for more information.

**TIBET:** For the first time, a Chinese government delegation is negotiating with a Tibetan nongovernmental organization (NGO) on issues concerning Tibet's environment. Concerns for the survival of a sacred lake and the people and wildlife that depend on it were the topic of a mutually agreed upon resolution between the parties.

Lake Yamdrok Tso, just south of the Tibetan capital of Lhasa, is the site of a massive pump storage hydroelectric power plant now under construction. The International Committee of Lawyers for Tibet (ICLT) succeeded in passing a resolution at a recent World Conservation Union (IUCN) conference that calls upon the Chinese government to strengthen its efforts of cooperation with the international community in the exchange of information, to establish a nature reserve at Yamdrok Tso, and to make use of the IUCN's expertise in performing Environmental Impact Assessments, especially in the field of biological resources conservation. The resolution was backed by the IUCN and agreed to by the Chinese government.

The construction of a hydroelectric power plant on the Yamdrok Tso lake south west of Lhasa is the most destructive of all development projects in progress on the Tibetan plateau today. The project aims to drain a natural lake by placing the turbines in tunnels bored into the mountains surrounding the lake. - *The Free Tibet Campaign*

*The group has published a report about the Yamdrok Tso project, entitled Death of a Sacred Lake. Contact: Free Tibet Campaign, 9 Islington Green, London N1 2XH UK; Tel: 44 171 359 7573 Fax: 44 171 354 1026; Email: [tibetsupport@gn.apc.org](mailto:tibetsupport@gn.apc.org).*

## **TROUBLED WATERS**

**UK:** Water has been big news in Britain this year, as the normally damp land experienced its second year of drought. Severe water shortages and poisonous algal blooms in rivers and reservoirs were two unpleasant side effects from the unusually dry years. In Yorkshire, lower than average rainfall coupled with an estimated 33 percent rate of leakage through the delivery system led one water company to carry water by tankers to keep the taps of Halifax and Huddersfield flowing.

Yorkshire Water has turned increasingly to "emergency abstractions" from local rivers to meet demand. The private company - England and Wales privatized all water companies in 1989 - has been granted some 40 "drought orders" since August 1995. A drought order allows the company to take more water from a river than its existing license allows. Since many Yorkshire rivers are now experiencing low flows, increased abstractions cannot be sustained - especially as the problem of algal bloom has spread across the country. Low flows contribute to the blooms, which are caused by excess nitrogen from sewage and farm runoff, because pollutants are not flushed through. New Scientist reported in May that dozens of rivers in Britain were affected for the first time during the drought. Water contaminated by algal blooms can be deadly to humans and animals, and the toxins can persist in the environment.

To avoid overtapping local rivers, Yorkshire Water is now leaning toward inter-river transfers to supplement its supply. Although the current crisis has abated somewhat now that winter rains have begun, the company has pipes and pumps in place to begin transferring water from Northumbria should another dry year occur. - *Stephen Warburton, Yorkshire Wildlife Trust*

**NAMIBIA:** An ongoing drought in Namibia has prompted the government to move rapidly forward with plans to build a pipeline from the Kavango River, which now runs wild from its headwaters in Angola to Botswana's Okavango Delta. The 250-kilometer pipe, which would draw continuously from the river to supply Namibia with some 25 million cubic meters of water per year, would be the first major diversion of the river's waters.

The US State Department reports that the project will likely go to Parliament in mid-February, although a hurried environmental impact assessment won't be ready before March. Originally, the private consultants studying the project for the government were asked to look only at impacts to the Namibian border, largely ignoring impacts to the delta. But when the international NGO Conservation International said it would coordinate an independent EIA to look at impacts to the delta, the Namibian

government stepped in with plans for a full study itself. Because the study is to be done by the engineering consultants who will build the project, a group of NGOs calling itself the Okavango Liaison Group is calling for an independent EIA and a thorough consultation process that would ensure review by the governments and NGOs in both countries.

The idea of the pipeline first surfaced in a 1973 Namibian water-use plan. But it wasn't until Namibian independence in 1990 that the nation's capital, Windhoek, began to grow rapidly. The city is currently growing at 5-6 percent a year, and water use is expected to quadruple from current levels by 2020. Currently, the city is pumping its groundwater at double the estimated rate of replenishment, the State Department reports. The city has taken measures to conserve water in recent years, including installing systems to recycle waste water and reduce losses through its water distribution system, a public education campaign and raising rates for heavy users. Controlling growth is not, however, part of its water-use plans.

Executives from the multinational fiberglass firm Owens-Corning have been meeting with the US Ambassador in Windhoek in early efforts to win the approximately US\$50 million contract for the project's pipe, and are considering a deal that could give the project a boost. "Should it win the pipeline tender, Owens-Corning is considering setting up a pipe plant in northern Namibia," the State Department reports. "The Ambassador noted that such a proposal would carry great weight with the Namibian government, which is anxious to promote industrial development."

## **BIODIVERSITY**

**US:** The Shasta Dam in Northern California is getting an \$80 million alteration to help an endangered run of salmon harmed by the dam's changes to the Sacramento River. The retrofit involves a device that will pull cold water from the depths of the reservoir to help keep young fish from dying in the too-warm waters released downstream. Winter-run chinook salmon embryos and fry begin dying at 57.5 degrees; the reservoir has reached 62 degrees in times of drought. The 55 miles downstream of the 602-foot dam are prime salmon habitat, but their numbers have dwindled in the half a century since the dam was built. The New York Times reported in July that "once complete in December, the cooling system will be the largest structure ever devoted to fish preservation."

In 1987, the Bureau of Reclamation began voluntarily shutting down Shasta Dam's electricity production so that cold water could be released to protect the fish, resulting in revenue losses of approximately \$40 million over the years. The new device will allow cold water to be released year-round, thus enabling the dam to produce electricity in the warmer months.

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# World Rivers Review

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## SHORTS

Contaminated drinking water kills more than 400 children around the world every hour of every day. Now a new invention should help reduce this ghastly toll. The simple device uses ultraviolet light to rid water of pathogens, including cholera, typhoid, dysentery and hepatitis. Ashok Gadgil, a physicist at Lawrence Berkeley National Laboratory in California, and his colleagues have built a tabletop system that uses mercury-vapor lamps to kill pathogens at a rate of 15 gallons per minute, at a cost of 2 cents per metric ton of water. The unit weighs just 15 pounds, costs under \$300 and can be run on solar cells, reports *WaterWorks* (April 1996)

Sri Lanka suffered severe hydropower shortages this year due to drought, affecting industrial output and causing daily power outages. Air conditioners, neon signs and late-night television were all banned in an effort to avoid a complete blackout, the *Financial Times* reported (June 4, 1996). Hydropower accounts for 80 percent of Sri Lanka's electrical supply. "We want the country to pray for rain because there is nothing else we can do," said a spokesman for the Ceylon Electricity Board.

The Ministries of Emergencies has issued a warning to residents of Kyrgyzstan about radioactive contamination of a major river system following reports that radioactive wastes dumped into old uranium mines could be ending up in the river Mayly-Suu, which feeds into the Syr Darya river system in Uzbekistan. So far, 23 dumps have been identified, reports *IPS Environment Bulletin* (Sept. 26, 1996). Kyrgyzstan has no operating uranium mines, but storage of wastes from past uranium processing has now led to a serious situation in the town of Mayly-Suu, which is recording gamma radiation 10 times accepted levels. High levels of radiation have since also been discovered in the Syr Darya River, and are now posing a threat to Uzbekistan's main agricultural region.



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## **Second *River of Words* Poetry and Poster Contest Underway**

by Pamela Michael

When International Rivers Network teamed up with United States Poet Laureate Robert Hass in November 1995 to create a national contest for American schoolchildren on the theme of watersheds, our enthusiasm and ideas were boundless; time and funds, however, were short. Despite the obstacles (and thanks to help from American Booksellers and Northern California Independent Booksellers Associations, Faultless Starch/Bon Ami, Bantam Doubleday Dell and Robin and Marsha Williams) we were able to take eight prize winners and assorted parents, siblings and teachers to Washington, DC in April (the month of both National Poetry Month and Earth Day) to be honored at the Library of Congress.

The response to the *River of Words* curriculum has been overwhelming. Our Berkeley office has been flooded (pun intended) with requests for our Teacher's Guide, which contains a wealth of classroom and field activities, poems, maps and other material to help students explore and understand their own watersheds. Prepared with the help of poets Robert Hass and Gary Snyder, watershed activist Peter Berg and others, the 40-page book also offers an extensive resource guide and bibliography, listing books, publications, organization, curriculum materials, web sites and more on rivers, watersheds, cultural and natural history, poetry and art.

We've also had a steady flow (another inescapable pun) of entries from 41 states and thousands of children forming many partnerships with programs like 4-H, GREEN, Kids in Creeks, WritersCorps, Teachers & Writers Collaborative, Poets in the Schools and others, to get our watershed curriculum implemented in as many places as possible.

To our delight, colleagues in France, Germany and Japan are mounting their own *River of Words* projects with our help; next year Russia and Spain will be up and running. Adding the arts (and the heart) to the environmental education mix seems to be an idea that many are eager to embrace.

[More information about River of Words.](#) The deadline for the next contest is February 15, 1997.

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## Hot Off The Press

"Massive dams," writes Patrick McCully in his new book, *[Silenced Rivers: The Ecology and Politics of Large Dams](#)*, "are much more than simply machines to generate electricity and store water. They are concrete, rock and earth expressions of the dominant ideology of the technological age."

McCully, campaigns director for IRN, presents a critical analysis of the wide-ranging affects of dams, backed by well-documented case studies.

In a clear and concise manner, *Silenced Rivers* covers the environmental effects, human consequences, technical failures and elusive benefits of large dams. It describes the history and politics of dam-building worldwide, and sheds light on how the dam industry and international banks promote the technology around the world. The book also covers flood control, agricultural practices, energy alternatives and watershed management.

*Silenced Rivers* also tells the story of the rapid growth of the international anti-dam movement. It stresses how replacing large dams with less destructive alternatives will depend upon opening up the dam industry's practices to public scrutiny.

"This is the best-researched, best-written account ever of what we have done to our rivers," says Catherine Caufield, author of *In the Rainforest*.

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## **German Export-Import Bank to Lend for Three Gorges Dam**

*by Juliette Majot*

Just days before a scheduled parliamentary debate over support for China's Three Gorges Dam, Germany's export-import bank, Hermes-Buergschaften, agreed to grant loan guarantees for the project totaling hundreds of millions of marks. Hermes-Buergschaften officials are reported to insist that all details of the agreement remain secret.

"It is hard to conceive of a worse project than the Three Gorges Dam. By backing it, Hermes-Buergschaften has made it clear that they are willing to back anything," said Heffa Schücking of the German nongovernmental organization Urgewald.

By granting loan guarantees, Germany joins Canada in easing the way for lucrative domestic procurement contracts on the Three Gorges Project. NGOs from around the world are calling for a reversal in the decision.

In a letter to German chancellor Helmut Kohl, 35 groups condemned the bank's backing. "The Hermes-Buergschaften support for the Three Gorges Dam opens wide the floodgates for an environmentally destructive, economically wasteful competition, a 'race to the bottom' for export credit agencies around the world to ignore the most minimal ecological developmental and human rights criteria," the letter says.

The German parliament is still planning to vote on a motion introduced by the Green Party that would record Parliament's opinion of the Hermes-Buergschaften decision. However, Parliament has no formal authority over the bank.

The German bank's decision runs directly counter to that made in the US regarding the project. In May 1996, the US Export-Import Bank decided against supporting Three Gorges, and voiced serious reservations about the dam's environmental and social impacts and its economic viability. The US Ex-Im Bank's board voted unanimously to withhold support, and at the same time requested further information from the Chinese government on a wide-ranging set of issues including water pollution, accumulation of sediment in the reservoir, potential threats to endangered aquatic and terrestrial species, destruction of cultural resources, and forcible resettlement of more than one million people for the dam's reservoir.

"Instead of using the US decision as highly valuable information, Hermes, and therefore the German government, chose to ignore it. By doing so, it has characterized itself as something of an international environmental outlaw," says Owen Lammers, executive director of International Rivers Network.

NGOs are pointing to the Hermes decision as typical of an organization suffering from a systemic lack of accountability and transparency. "Unfortunately, this incident is not unique," says the letter to Kohl. "In the name of protecting business confidentiality, Hermes-Buergschaften denies the German taxpaying public an opportunity to review projects before they are approved." In addition to reversing the Three Gorges decision, NGOs are calling on Kohl to appoint independent environmental and academic representatives to the agency's Advisory Board, to provide the public with information on proposed projects and environmental reviews.

Export-Import agencies in Japan and Switzerland are expected to make their own decisions on whether or not to back Three Gorges within the next few months.



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