

World Rivers Review

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A River Map for the New Millennium

As much of the world watched the Y2K bug fizzle and New Year's celebrations sizzle at year's end, tens of thousands of people in India, Thailand, Colombia and elsewhere were engaging in peaceful, ongoing protests to defend their river-based communities from the threat of large dams. Some of these brave people passed the changing of the millennium in occupations of dam sites in an attempt to get official attention for their plights. Others protested by refusing to leave their homes, vowing to drown before they would move for projects whose benefits are not intended for their communities. There were no fireworks or champagne, but there were prayers that rivers be protected and the communities they support be allowed to live in peace. There were songs of solidarity. And after years in which the only sure thing in these people's lives has been relentless uncertainty, there was speculation: Would the new century bring any meaningful changes that would help them protect the rivers they love?

We at IRN have been wondering, too, what the 21st century has in store for the world's rivers and the people who depend upon them. The past 100 years were disastrous for rivers and river peoples, and the optimists among us here believe things can only get better. But to really improve the state of our rivers will require more than fighting off a dam here and a diversion scheme there – it will require a shift in thinking about rivers and our relationship to them. We need a river map to guide us.

So we decided to ask a number of highly respected people whose lives intersect with rivers in some significant way to do a little crystal-ball-gazing for this issue. What better way to get the new millennium's thinking onto a new track than to get key thinkers to tell us their hopes and dreams for the future of rivers? On these pages, and also in the story on page 10 by US Secretary of the Interior Bruce Babbitt, we offer the beginnings of a river map to guide us. What we need now are the hope and courage to follow it.



Photo: Han Krishna

Medha Patkar, with others from the NBA, prayed in the rising waters of the Narmada River as it rose behind the Sardar Sarovar Dam in last year's monsoon. Read her thoughts on a better way, below.

Hoping for a Saner New World by Medha Patkar

“Millennium? What is that?” asked Ranya Gonjya Padvi, an *adivasi* farmer from the Narmada valley. He has been in the forefront of the struggle against the dam for 14 years.

Respected for his wisdom, analysis and wit, he wonders, “Why so much celebration over

the change of some date, some year? And, pray, what really changes with your millennium?” I cannot easily answer.

The present millennium extravaganza can be explained away as the dominant class imposing its preferences, culture and values on others; they have been setting the norms of the 20th century and are also snatching the initiative for the next millennium. Money and the market determine what to celebrate and when. But the real hallmarks

of this century are nothing to celebrate: a legacy of inequality in rights, power, money and land, and the continuous exploitation of human and natural resources.

The present development pattern, which is the culmination of the processes of many centuries, tends to give more importance to money over human and natural capital. In fact, the current development model has resulted in a continuous

undermining of the world's human and natural capital. This is our challenge for the new millennium – to erode the current patterns of over-consumption and wealth-accumulation, and emphasize instead the non-consumerist lifestyle.

We will have to give more value and priority to our relations with nature and other human beings over economic gains. Without this change of emphasis, we will be missing the basic reason for living. A Native American

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Rivers for a
Thousand Years

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International Rivers Network is an affiliate organization of Friends of the Earth International.

Despite all the hype surrounding the millennium, the Year 2000 has at least provided a good excuse to reflect on the state of the world's rivers and river peoples. So we put together this special issue, entitled "Rivers for A Thousand Years," to look at where we are, where we've come from, and where we want to go in our efforts to protect rivers from large dams and other harmful river-engineering schemes.

Some clear messages emerge from the articles herein. First, the current development pattern must be changed, so it no longer benefits the rich at the expense of poor communities and the environment. The emphasis needs to be on democratic development, which can only come when people affected by development projects are full participants. Finally, dams are not forever, and now is the time to move toward removing or at least re-operating dams in ways that will restore ecosystem functions, species-diversity and community links to their rivers.

Read about where we've come from in a brief history of the anti-dam movement, beginning on page 4. This powerful people's movement has for the past 20 years fought against dams, but it is not just an anti-dam movement – it also advocates for more sustainable, equitable and efficient technologies and management practices for rivers, and more transparent and democratic decision-making processes for river projects. These are the stories we wish to remember as the 20th century winds to a close, and where we turn for inspiration and strength.

The article on "living rivers" on page 6 explains where we are in terms of riverine health, and describes the kinds of changes that are required to restore "dam-aged" rivers as we move away from the era of large dams. The author, a hydrologist and civil engineer, explains how we must "free ourselves from the legacy of engineering decisions made 60 years ago" and embark on large-scale restoration of the world's rivers, so they may once again function as healthy ecosystems.

This issue's cover story, which pulls together various river-luminaries' predictions for the world's rivers, shows where we hope to go in the next millennium. The compilation of essays reveals that river-protectors everywhere have great hopes that the changing millennium will also bring a changing of attitudes toward rivers and those who depend upon them. The authors hope that in the coming century, rivers will no longer be treated as "utilitarian resources" merely to be exploited for profit; that communities who depend on rivers will not be shunted aside when projects are proposed, and that we need to make more use of the existing water supply we already have, rather than developing new dams. "The big task of the coming century will be to restore rivers, wetlands and fisheries," says US Secretary of the Interior Bruce Babbitt, in an exclusive article for *WRR* (see page 10).

We'll toast to that.

Lori Pottinger

News Flash: Flood Wall Street

In other news, IRN has developed a new web site that we hope will help slow progress on the world's most destructive dam, China's Three Gorges project on the Yangtze River. The new site, www.floodwallstreet.org, includes a petition calling on Wall Street investment banks to stop financing the project.

While shareholder activists have been putting pressure on major banks involved in Three Gorges Dam, it is critical that before April 2000 these banks' customers voice their concerns about this destructive project. In addition to signing the petition, if you are a Discover or Citibank credit card holder, or if you're a customer of Merrill Lynch, Morgan Stanley Dean Witter, Chase Manhattan Bank or Citigroup (which includes Smith Barney Mutual Funds, Primerica Financial Services and Traveler's Insurance), write a letter expressing your concerns about their involvement in Three Gorges Dam. Remind them, too, that you can take your business elsewhere. Information on who you should contact can be found on the new web site.

The \$30 billion dam, now in its second phase of construction, is plagued with problems, as *WRR* readers are well aware. Corruption and technical problems are increasing the project's costs, and casting doubt on its final completion.

So take this opportunity to speak up, spread the word, and sign the petition. The dam is desperate for foreign money. Don't let it be yours.

Doris Shen

"We as a people can be heard"

Cape Town Hearings Give Dam-Affected People a Chance to Speak

by Steve Rothert

The Himba of Namibia, the Batonga of Zambia and Zimbabwe, the Basotho of Lesotho, the Xhosa and Zulu and Amangwane of South Africa, the Swazi of Swaziland: these Southern African peoples have different languages, customs and nationalities. But they all share a common experience: large dams have affected their lives and cultures. And all were given the opportunity to speak out about these experiences at the Southern African Hearings for Communities Affected by Large Dams, held in Cape Town in November 1999. The two days of testimony revealed that people's experience with large dams in the region has largely been one of trauma, immeasurable losses and broken promises.

The hearings were hosted by two South African NGOs, Environmental Monitoring Group and Group for Environmental Monitoring, and IRN. It was held to gather information from the region to be submitted to the World Commission on Dams (WCD) for incorporation into their final report.

"This is our time – when we as a people can be heard." Thus began Chief Syankusule's account of being forcibly moved in 1957 along with 57,000 other Tonga from the Zambezi River valley to make way for the Kariba Dam. "They came into our village with large trucks to take the elderly people and children. We said we want to know where we are going, what kind of soils we will have, what will happen to our livestock, our property, our graves. Some said, 'No, we will not go.' So they sent the soldiers and killed some of our people because they did not want to move from the river. Then we all moved – all except our ancestors who are still buried under the water."

Each successive presentation wove another thread in the cloth of common experiences that connects dam-affected communities. The trauma of being relocated, such as when the then-apartheid South African government ordered Mrs. Mbalula and her fellow farm workers along the Orange River to pack their belongings and vacate their homes that same day to make way for the Gariep Dam. The lack of participation in the decision-making process, such as the Namibian government threatening to resettle Chief Kapika and other Himba to make way for Epupa Dam despite

the fact that the Himba say they will not leave their lands. The loss of livelihoods that cannot be regained, such as that of Anna Moepi of Lesotho, whose precious agricultural land was submerged by Katse Dam and replaced not with more land but with some cash and promises for a new livelihood that still has not come these many years since she was resettled. The promises that are broken, such as that made by the Department of Water Affairs to Patrick Mphalala of South Africa that he would get a new home to replace the one he lost to Woodstock Dam in 1977. He and his community continue to live in corrugated tin houses.

The flow of disturbing accounts was interrupted only once by one with a happy ending. Olive Sephuma of Botswana described how communities living in the Okavango Delta strongly objected to the government's plans to dredge several channels and construct two dams in the delta. The government listened to the communities' opposition, and commissioned an independent review of the project, which showed that the project was fatally flawed. This independent study revealed the project's flaws and resulted in the government cancelling the project.

Sephuma's story highlighted two of the recommendations that participants identified as critical in considering future dam projects: that affected communities must have a voice in deciding whether or not a project should go ahead, and that proposed projects should be independently evaluated to verify claims of project benefits.

Declaration to WCD

Participants had other recommendations, in a declaration signed by all affected people in attendance and submitted to the World Commission on Dams. The declaration stated that affected communities must become "shareholders" of dam projects, so that project benefits accrue directly to them, and that "Governments should compensate us for outstanding losses and damages caused by large dams." It further stated that communities must be empowered and funded to participate effectively, including informing them of their rights; and that all project documents must be made publicly available, including budgets. The communities said that project

developers (including governments and funders) must take responsibility for all aspects of project development and enter into binding and enforceable contracts for compensation and resettlement programs. "Resettlement and compensation issues must be resolved to the satisfaction of communities before construction begins," the statement reads.

The hearing drew a number of notable speakers from the region. In closing remarks, Justice Albie Sachs, of South Africa's Constitutional Court, drew connections between the communities' dam-related human-rights struggles with that against apartheid. He said dam-affected communities, like those affected by other struggles, had been denied the dignity of being treated like human beings and the justice of participating in an appropriate process that would affect their futures. He also stressed the need to make reparations for redressing past injustices.

Another speaker, Ronnie Kasrils, minister of South Africa's water affairs department, said, "I am not a Luddite, and I know how much progress has been made by engineers and industrial development, but it has become abundantly clear to all of us that the costs of ill-considered developments have been extremely high ... Water management is not an end in itself. Its purpose is to contribute to a just society. A society in which all people can live in dignity, in which all are provided the building blocks for a decent life." ■

Hearings Report Available

The submission to the WCD from participants at the conference is available on the IRN web site (<http://irn.org/programs/review/000121.safrica.html>). The hearings report, which includes all submissions, speeches and other information gathered for the event, is available for R75 (US \$12.50) plus postage from Environmental Monitoring Group, Attn: Liane Greeff, PO Box 18977, Wynberg, South Africa.
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A Stream of Consciousness

The Anti-Dam Movement's Impact on Rivers in the 20th Century

by Patrick McCully

It was the worst of times ...
but it led to the best of times.

The 20th century devastated the world's rivers like no other period in history. In addition to other industrial-age insults, large dams took a terrible toll. In the past 100 years, some 40,000 large dams (at least 15m in height) were built on the world's rivers, and few major rivers remain dam-free. Dam reservoirs have flooded perhaps a million square kilometers (one percent of our planet's land surface) and displaced up to 60 million people, most of whom became permanently poorer as a result. The environmental toll was equally shocking: estuaries were degraded, fisheries decimated, forests destroyed. Poor nations' economies were weighted with debt, and corruption often marred the decision-making process. The projects that did all this harm rarely delivered the amount of benefits their promoters promised. And those who received the greatest share of benefits tended to be the already well-off.

But the reaction to this human hubris has been a strong and growing people's movement to save rivers and riverine communities. Actions by groups large and small, together with the poor economics of dam building, are making it increasingly difficult to build dams in most of the world. Construction of large dams is dropping fast,



Photo: Hari Krishna

Last year's "Rally for the Valley" drew thousands to India's Narmada valley, where anti-dam activism is strong.

from a peak of around 540 a year in the 1970s to 200 a year in the 1990s.

This people's movement is comprised of thousands of environmental and human rights groups on all the world's continents except Antarctica. Dam builders bemoan its effectiveness. Wolfgang Pircher, then President of the International Commission on Large Dams, warned in 1992 that the indus-

try faced "a serious general counter-movement that has already succeeded in reducing the prestige of dam engineering in the public eye, and it is starting to make work difficult for our profession."

This movement is not just anti-dam; its broader mission is to advocate for more sustainable, equitable and efficient technologies and management practices for rivers, and

Time Out For Rivers

This brief history of the damming of the world's rivers reveals that as more and more concrete was poured around the world, an increasingly large people's movement arose to defend rivers.

The Boom Years of Dam Building

1902: Britain builds the first of many dams on the Nile, the Low Aswan Dam. Its water is used to irrigate cotton for English mills. Peasant farmers who grew crops for local consumption are displaced.

US Congress passes National Reclamation Act establishing the Bureau of Reclamation and enabling big government-funded irrigation projects in western US.

1932: Dneprostroi Dam inaugurated in the Ukraine. Then the world's largest hydropower dam, it is described by its chief engineer as "the mighty foundation of socialist construction."

1933: President Roosevelt establishes Tennessee Valley Authority. By 1979, TVA had built 38 large dams and inspired numerous projects around the world.

1936: World's first megadam, Hoover, is completed. Elsewhere in the US, more multipurpose megadams are under construction, including Bonneville, Fort Peck, Shasta and Grand Coulee.

1948: World Bank makes its first loan to a developing country – for three dams in Chile. Since then the World Bank has made loans to more than 600 dams in 93 countries.

1949: Communist Party wins power in China and begins massive campaign of dam building. Today, around half the world's large dams are in China.

1957: Construction of Sanmenxia Dam on China's Yellow River begins. Three years later, it is crippled by sedimentation. After two redesigns it finally starts generating 250 MW in 1973 – one-fifth its expected capacity. 40 years later, the majority of the 400,000 resettled for the dam still live in extreme poverty. 57,000 Tonga people are evicted from their lands along Zambezi River to make way for World Bank-funded Kariba Dam. Colonial police shoot at those

who refuse to move, killing 8. More than 40 years later, most resettlers still live in poverty.

UN sets up a committee to plan dams on the Mekong; the dams are supposed to help stop the spread of communism. In subsequent years, US engineers design 7 dams for the Mekong mainstream which would store one-third of the river's flow and result in massive forced resettlement. Hundreds more are planned for tributaries in Thailand, Laos, Cambodia and Vietnam. Most plans are shelved during the war, but many are being seriously considered today.

1961: Indian Prime Minister Jawaharlal Nehru lays foundation stone of a dam on the Narmada River, now called Sardar Sarovar. Families displaced in the 1960s have still not been properly compensated.

1962: South Africa's apartheid government approves the multi-dam Orange River Development Project. The ambitious scheme was planned to restore international confidence in South Africa in the aftermath of the Sharpeville massacre. The project cost four times original estimates and irrigated half the land planned.

1963: A massive landslide into Vaiont Reservoir in the Italian Alps creates a huge wave which overtops

more transparent and democratic decision-making processes for river projects. Struggles which started with the aim of improving resettlement or stopping a specific dam have matured into movements advocating an entirely different model of development. Transparent decision-making is now seen by many dam opponents as being as important as the decisions themselves.

Below is a brief history of the anti-dam movement in the past century. Space permits us to run just a few of the many inspiring stories of this movement, but other significant events are touched upon in the timeline below.

Eastern Europe: Authoritarian Dams

In the first public demonstration since the brutally crushed uprising a generation before, 15,000 Hungarians took to the streets of Budapest in October 1988. The demand was not an end to Communist rule, but an end to the damming of the Danube. Yet one result of this anti-dam campaign was that it helped build confidence among Hungarians to speak out against, and ultimately overthrow, their Communist rulers. A similar story lies behind the fall of authoritarian regimes elsewhere in Europe, with environmental protests – and opposition to dams in particular – acting as a lightning rod for public mobilization against deeply unpopular regimes.

In the early 1980s, Hungarian scientists began to question the proposed dams' environmental impacts. These unaccustomed challenges to Party wisdom provoked a backlash, and in 1984 the authorities banned all

public speaking on environmental issues and all media coverage of the dams.

But a small group of dam opponents were not silenced. After the crackdown they illegally set up Duna Kor (Danube Circle), then one of the very few independent citizens' groups in the Eastern bloc. The initial aim of Duna Kor was to break the secrecy surrounding Nagymaros Dam. Their first campaign activity was to covertly circulate a petition asking for the Hungarian parliament to debate the project; more than 6,000 signatures were collected.

In 1985, Duna Kor published the first environmental impact study of Nagymaros. The next year, they held an unprecedented press conference on the project's environmental problems. Activists were subsequently arrested and interrogated when they announced plans for a protest march. The march went ahead, with marchers being met by tear-gas and clubs.

In May 1989, the government suspended work at Nagymaros. A parliamentary resolution abandoning the project was passed in October. The first free elections in Hungary took place the following spring. "The breakthrough to political change," says Andras Biro, "occurred when the government suspended work on the dam."

India: The Long Struggle

Medha Patkar first came to the Narmada Valley in 1985 to study the villages to be submerged by the Sardar Sarovar Dam. As her research progressed, Patkar grew increasingly horrified by the treatment of villagers at the

hands of the project authorities. Over the next few years, Patkar quit her research to travel through the submergence zone, living with the people to be displaced and urging them to organize.

Along with organizing at the village level, Patkar and other activists also began to analyze official documents. They found that crucial environmental studies had not been conducted, that the number of people to be displaced was unknown, that estimates of the amount of land to be irrigated were wildly optimistic, and that funds to build one of the project's most-touted elements, the water-supply infrastructure, had been left out of official cost estimates.

In 1989 the increasing number of groups of affected people and their supporters united into a single movement – the Narmada Bachao Andolan (NBA). In 1990 the NBA adopted the position which has remained at the heart of their struggle: that the project be suspended pending the completion of an independent, participatory review. Until this happens villagers will refuse to move to resettlement sites, even if it should mean that they drown under the rising reservoir.

One of the major victories for the NBA came in 1991, when a "Long March" of thousands of NBA supporters and a 21-day fast by activists forced the World Bank to commission an independent review of the project. The review, the Morse Report, was savagely critical of the project and the Bank's role in it. In 1993, the Bank canceled its funding for the project.

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the dam and kills 2,000 downstream. The dam, the fourth highest in the world, still stands, much of its reservoir filled with rock.

Glen Canyon Dam begins filling, drowning an irreplaceably beautiful desert canyon upstream of the Grand Canyon.

1965: Volta Reservoir; the world's largest, starts filling behind Akosombo Dam, flooding 4% of Ghana and displacing 84,000 people. The project is driven by US aluminum interests, the World Bank and Ghana's President. A few years later, 90% of children living near the reservoir are afflicted with schistosomiasis, compared with less than 10% before the dam. The dam generates around half of its predicted electricity and irrigates none of the land promised.

1972: High Aswan Dam completed. The project displaces 113,000 and results in the erosion of 5-8 meters of delta coastline annually and a 70% drop in fish catches. The area of land irrigated in Egypt was no greater in 1989 than before the High Aswan Dam.

Construction begins on Yacyretá, which eventually goes \$9bn over budget and is called "a monument

to corruption" by Argentinean President Carlos Menem. The project has still not been completed.

1975: Two large and many smaller dams break in China's Henan Province, killing 230,000.

1976: Wyoming's Teton Dam collapses, killing 11 and causing \$1bn in damages.

The Rise of the People's Movement

1981: Philippine government drops plans to dam the Chico River. The World Bank-funded plans sparked off violent resistance among the region's indigenous people.

1982: Chixoy Dam in Guatemala begins to fill. Some 400 Maya are killed by government-backed paramilitary forces for resisting forced relocation.

1983: Activists seeking to preserve one of India's last remaining areas of undisturbed rainforest force government to shelve plans for Silent Valley Dam in Kerala.

Gordon-below-Franklin Dam in Tasmania, which would flood rare temperate rainforests and important archaeological sites, is stopped by a national coalition of environmental groups and international publicity.

1985: First international anti-dam protests disrupt an International Committee on Large Dams meeting in Switzerland

World Bank approves \$450 million in loans for Sardar Sarovar Dam despite the project not having environmental clearance from the Indian government. Conditional clearance is given two years later; those conditions have never been met.

1986: To avoid apartheid sanctions, the World Bank arranges offshore financing to launch the Lesotho Highlands Water Project, which will bring water to South Africa.

US Congress passes an act requiring local cost-sharing and greater economic accountability for all federal dams, essentially halting all new major dams.

1987: Parliamentary decree outlaws dam-building on most of Sweden's few remaining undammed rivers.

IRN founded.

1988: Coho salmon become extinct on the Snake River in the US.

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The Flood Next Time: Restoring Living Rivers

by Philip Williams

At the end of the 20th century, society came to the belated realization that human activities have greatly harmed the global environment. The water world has been particularly hard hit, from the worldwide deterioration of freshwater resources, to the destruction of rivers, wetlands and estuarine ecosystems and the loss of the biodiversity these ecosystems support, to the degradation and impoverishment of millions of river-dependent people. Almost everywhere on the planet, rivers have been affected by pollution, channelization, destruction of their watersheds, and, in profound ways, by large dams.

As we begin the 21st century, there is increasing interest in restoring our damaged rivers. Some governments now accept the need to clean up pollution or reforest damaged watersheds. Numerous water managers have begun to recognize the benefits of reconnecting rivers to their floodplains.

But in contrast to this flood of activity to restore riverine health, most governments and river-planning agencies around the globe still do not fully acknowledge the central role of dams in perpetuating and accelerating environmental degradation. Such an understanding is essential if we are to stop repeating the mistakes of the past and start healing the problems of the present.

Living Rivers

Every river basin has a unique geologic and climatologic history that has created its particular landform. This landform, from mountains to mudflats, has been created by geo-

morphic processes – the action of flowing water eroding and depositing sediments. Certain dynamic features of the landscape, such as alluvial floodplains or meandering river channels, can persist over tens of thousands of years in an evolving equilibrium, responding to periodic floods, tectonic movements, and sea level rise. Thus a watershed is a product of its own evolution, and contains a sort of virtual DNA which determines the unique character of the particular river that drains it.

Fish, plants and other species evolve to take advantage of the river's physical processes and the forms they create. For example, fish migrate at certain times of year when flows and water temperature are advantageous; riparian trees have adapted to seasonal flooding, and estuarine shellfish rely on nutrients released from decayed leaves from floodplain forests. This evolutionary history means that the integrity of the whole ecosystem is dependent on the integrity of the physical processes that sustain it. This dynamic interaction between river flow, river form, people, plants, fish and wildlife is what is meant by the term "living river" to describe the river ecosystem.

Like any other species, humans have interacted with and taken advantage of river ecosystems for tens of thousands of years. The abundance of fish and wildlife and the fertility of floodplain soils enabled river communities to prosper even as they transformed the landscape with fields and villages. Only in the industrial age, with the onset of widespread pollution and the construction of massive river engineering projects, has the

relationship between river ecosystem and human settlement become severely out of balance. The main reason for this unsustainable interaction is that now human intervention has drastically changed river processes as well as the landscape. A dam's impacts on ecosystems are massive and continuous, and prevent the river from healing itself.

What Dams Do

All rivers are both a river of water and a river of sediment. River systems are resilient and persistent because the erosion and deposition of sands and mud, together with regrowth of riparian vegetation, can quickly re-create disturbed landscapes – sometimes within a few decades. A straightened river will always tend to re-create its meander; a mined gravel bar rebuilds in the same place. In other words, the "living river" is inherently self-healing, always evolving to re-create its healthy form, provided the movement of sediment is not impaired. To return a river to a living state requires understanding, maintaining and restoring key physical processes that sustain the landscape, processes like regular inundation of floodplains, movement of gravels, or summer flow levels.

In the past 60 years human technology has become capable of constructing dams large enough to eliminate and transform key physical processes in the world's largest rivers. Major dam projects have been planned and executed with little understanding of the consequences of these alterations on the health of the river. Using a medical analogy, the initial construction of

Time Out For Rivers (continued)

A coalition of local, national and international groups stops construction of Nam Choan Dam in Thailand, thus preserving the Thung Yai Wildlife sanctuary.

International dam-fighters conference draws activists from 26 countries. The group draws up the San Francisco Declaration, which sets out guidelines to be followed in deciding on dam projects.

1989: Public pressure forces Hungarian parliament to abandon Nagymaros Dam and suspend work on Gabčíkovo Dam.

The growing network of local and national groups opposing dams on the Narmada forms the Narmada Bachao Andolan.

1991: Protesters take over Brazilian public power offices for nearly a month, demanding solutions to problems caused by Tucuruí Dam.

Brazil's National Movement of People Affected by Dams (MAB) is formed.

For the first time in its history, the World Bank meets with people who would be affected by one of its dams, Pak Mun in Thailand.

1992: China approves construction of Three Gorges Dam. Official resettlement plans estimate that 860,000 will be forcibly resettled; these numbers are later bumped up to 1.2 and then 1.8 million.

1993: World Bank withdraws from the Sardar Sarovar Project after its independent review confirms huge problems first described by the NBA and other NGOs.

Calling the project "outdated and overly expensive," US Bureau of Reclamation pulls out of Three Gorges Dam, for which it was contracted to offer technical support.

1994: Daniel Beard, head of US Bureau of Reclamation, proclaims: "The dam-building era in the United States is now over."

For the first time, the Columbia River is closed to commercial salmon fishing. The 130 dams in the Columbia Basin are considered the biggest factor in the decline.

US Congress approves a reparations payment of \$54m to Native Americans who lost lands, fisheries and burial sites to Grand Coulee Dam.

Cree resistance forces suspension of the last two phases of Canada's James Bay Project.

The planned Serre de la Fare Dam on France's Loire River is canceled in favor of an alternative flood control strategy proposed by activist group SOS Loire Vivante.

Thai villagers first occupy Pak Mun Dam site, demanding adequate compensation for lost fisheries.

Hundreds of NGOs from 43 countries endorse the Manibeli Declaration, which calls for a moratorium on World Bank funding of large dams.

Nagara River Estuary Dam is completed despite prolonged opposition due to its environmental impacts and lack of purpose. The campaign galvanizes a national anti-dam movement in Japan.

1995: World Bank cancels Arun Dam in Nepal, saying the project was too risky, would crowd out other social investments, and that alternatives existed. Another factor was that NGOs had filed a pre-emptive claim against the project with the Bank's Inspection Panel.

Research shows that rotting vegetation in the reservoir of Brazil's Balbina Dam releases 26 times more greenhouse gases than an equivalent coal-powered plant.



An engineered river reclaims its floodplain.

the dam is an acute shock to the system, but it is the continued operation of the reservoir that creates chronic illness in a healthy river by changing its hydrology and geomorphology. There are many ways dams affect physical processes essential for sustaining a living-river ecosystem, but in problems of river management and restoration the following are the most important pathologies:

“Persistent Bleeding” (Diversion): The impacts of reductions in flow are easiest to see. The greatest impacts occur in the low-flow season of drought years, but in some semi-arid regions the downstream river channel has been almost permanently completely dried up by dams. For many years, restoring more natural flows has been a main focal point of habitat restoration efforts, and more recently this has extended to efforts to restore freshwater flows to sustain major estuaries like California’s San Francisco Bay. This has led to the formulation of minimum or “in-stream flow requirements” for fish. Some dam operators now

release a fraction of their inflow to provide such flow releases; proponents of this approach claim that this action alone will mitigate downstream ecological impacts. These claims are at best unproved. Restoring minimum flows does nothing to sustain and replenish critical habitats created

by floods and flow variability.

“Irregular heartbeat” (Elimination of the flood flow pulse). Seasonal and flood flow variations are the heartbeat of a river ecosystem. Typically, large reservoirs store seasonal high flows to release them for power generation or irrigation later in the year. This has the affect of greatly reducing flow variability downstream by capturing smaller frequent floods. Larger, infrequent hazardous floods are much less affected as they tend to fill the reservoir and then spill uncontrolled at the flood peak. These changes in flow variation and flood frequency have major adverse impacts on key river processes. For example, they typically eliminate regular floodplain ecological interactions without eliminating flood hazards. They eliminate natural periodic disturbance essential for rejuvenating wetland habitats. They prevent pulses of freshwater which sustain estuarine ecological processes. Finally, they reduce the capability of the river to move sediment downstream and allow choking of the channel with vegetation. Recently, attempts have been made

to release small flood pulses from some reservoirs to mitigate these adverse affects. Such measures alone are unlikely to be more than marginally useful if they do not also restore the flow of sediment to the river.

“Thinning of the blood” (Trapping sediment). Large reservoirs can capture almost all of the sediment carried by a river. Until the reservoir completely silts up, releases downstream are “clear water” flows that erode the bed and banks of the river channel until the natural sediment load has been regained. The impacts on river system habitats are profound. Lowering the channel bed isolates the floodplain from ecological interaction with the river channel as effectively as if it had levees, and channel lowering lowers the water table, thus drying up floodplain wetlands and woodlands. Silts and muds no longer replenish floodplain soils. The complexity of habitats in the river channel is simplified into a single uniform thread. Further downstream, mud no longer replenishes estuaries and sands are no longer delivered to beaches, degrading estuarine and coastal habitats.

Bringing Rivers Back to Life

The history of dam construction has been a history of environmental devastation. However, in the past two decades some attempts have been made to mitigate adverse impacts on fisheries, endangered species and wetlands; and recently in the US there has been a growing acceptance of the need to re-operate existing large dams for this purpose. A continued failing of these attempts is that they address symptoms, not causes. In the US we know that technical fixes like fish

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1996: European environmentalists defeat plans to channelize and build a series of dams on the Elbe River. 10,000 hectares of riverine forest on the Rhine, near the site of the canceled Hainburg Dam in Austria, become a national park.

1997: First International Meeting of People Affected by Dams is held in Curitiba, Brazil.

Slovakian activists defeat a proposed water-supply dam by lobbying for an alternative plan of small-scale water harvesting and conservation.

1998: Three dams are removed from France’s Loire River to restore fisheries.

World Commission on Dams is launched. Months later, its public meeting planned for India is canceled after Gujarat-state politicians threaten to arrest commissioners if they visit the Sardar Sarovar Dam project as planned.

US Secretary of the Interior Bruce Babbitt starts his “Sledgehammer tour” to restore aquatic ecosystems by removing dams.

Defying government repression, 10,000 people affected by Three Gorges Dam petition the government to solve resettlement problems.

The world gains 2,100 megawatts of new wind power; an all-time record. Wind power is now the world’s fastest growing energy source.

29 dams are removed in the US – a record. Total number of US dams removed during the 1990s is 177.

25,000 villagers occupy the Maheshwar Dam site, vowing to halt construction. Police brutally attack protesters; dozens are hospitalized.

First international “Day of Action Against Dams and for Rivers, Water and Life” results in 50 actions in 24 countries.

Formation of Pakistan Network on Rivers, Dams and People.

1999: Some of the largest dam-building companies in the world are brought to court for bribing the head of Lesotho Highlands Water Project.

Maine’s Kennebec River freed from the confines of the 162-year-old Edwards Dam.

China’s Ertan Dam is reported to be running at half-capacity and losing \$2.4m per day because its power is more expensive than cheaper alternatives which sprang up as it was under construction.

Thai villagers again occupy Pak Mun dam site to demand compensation for lost fisheries. Protesters call for removal of the dam if their demands cannot be met.

A “Rally for the Valley” brings thousands to march in opposition to dams in India’s Narmada Valley.

Embera-Katio people of Colombia march 700km to Bogotá to protest construction of the Urrá Dam, which will flood 7,400 hectares.

US Army Corps of Engineers report reveals that the best way to ensure salmon recovery on the Snake River is to remove four large dams.

2000: Protestors take over Maheshwar Dam site in India for fourth time. 4,000 arrested.

14 officials on Three Gorges project are accused in the Chinese press of embezzling \$600m from the project’s resettlement fund.

In a nonbinding vote, 90% of Japanese voters on Shikoku island reject a large dam, in the first referendum ever held on a public works scheme. Prime Minister says project will likely go ahead anyway. Activists promise to fight.

A River Map for the New

continued from page 1

dictum aptly expresses the issue: "After every fish is finished, after every forest wiped out, after every stream is dried up, do the men realize that the money cannot be eaten."

Equality and justice, too, should be incorporated as the core values of life and should even be considered in economic frameworks. This requires radical changes in the biases and technologies of production and consumption. These changes must complement the human side of production and creativity. We will have to evolve a new politics of technology. It is naive to believe that technology is value-free and has no politics. The challenge is to shift the control, interests and priorities embedded in technology to reflect the values of human and natural capital, and to better serve the common people and their priorities.

We have to abandon the bias for "official" science and technology and development based on these. We have to find technologies which deal with contemporary issues, and abandon archaic technologies like gigantic, centralized projects which cause large-scale displacement, degrade natural resources, and further intensify injustice and inequality. Those in power cannot just dismiss the people by saying there are no better alternatives. Alternatives will have to be found – by all.

Party politics will have to concede space to the growing move toward non-party politics, such as the decentralized, direct democratic systems which have been evolving through the people's movements. There are signs that a new international political and economic order is growing. In the age of the onslaught of globalization, there is a need to reassert the New Internationalism. The people's struggles and the explorations for development alternatives would be its cornerstone. Last year's widespread demonstrations against the World Trade Organization and its hegemonic and unfair trade system are just one example of the growing new politics and new ideology. The struggles of the Zapatistas in Mexico, Narmada in India, the Ogoni in Nigeria, and the anti-militarism and anti-nuclear campaigns are all questioning the status quo, and exploring new forms of politics and development.

The new millennium will definitely reassert democracy in a way that more closely ties it with development. When the *adivasis* and peasants can freely question the "experts" and bureaucrats about their

schemes, that is democratic development. It must be based on the liberation for the smallest and lowest, not the liberalization for the moneyed few.

This is not just utopian dreams – you can hear the rumblings all over India, and in many places around the world. All the people's movements during this century have been preparing the ground for this new understanding. These smolderings cannot be suppressed

Medha Patkar is one of the founders of the Narmada Bachao Andolan, and a winner of the Goldman environmental prize.

Free-flowing Visions

by Juliette Majot & Phil Williams



The first century of the new millennium will be a century of rivers restored, of fisheries reborn, of the link between people and their rivers reformed. In the next 100 years, our hope is that humankind will restore rivers to life by explicitly refusing to perpetuate the human greed, ethnic and racial hatred, and political expediency that have led to the current state of crisis for the world's rivers. We will recognize the intrinsic value of the earth's natural systems, and our reliance on their integrity. We will understand that bringing our rivers back to health is not just a matter of the science of ecology, but, more profoundly, of how society as a whole interacts with rivers.

Since the beginning of the industrial age, rivers have been increasingly treated as utilitarian resources to be exploited for profit: their flow mined for water and power, their channels straightened for shipping, their floodplains expropriated for development. In the past century, more people have become disconnected from their rivers, and have lost the understanding that rivers have value as living systems that nourish the land and as sacred places that nourish the soul. These precepts have been kept alive by river communities around the globe, where the intimate relationship between river and life is evident and the sound caretaking of the watershed is essential. These communities have been the linchpin of a highly active and effective social movement that for nearly two decades has fought to protect rivers from large dams. For the next millennium, we will continue our efforts to ensure that more and more people regain this essential

knowledge about the value of rivers, and about their relationship to and role within their own river system.

Our vision for the new millennium also includes repairing the damage that is already done. We will work to support the villagers in river communities where restoration and reparation must be made for past damages. The scale of this effort is huge, and will require a wide and deep international movement to press for the required social change.

The best reparation of all, of course, is giving people back their river valleys. Hence, over the next 100 years we will remove or decommission thousands of dams that currently choke most of the world's rivers. Again, this will require the growth and strengthening of an international movement. Major steps must be taken to successfully restore our rivers and watersheds. There must be an honest and rigorous accounting by governments, the dam industry and funders of the catastrophic decline in river ecosystems over the last century, and a clear recognition of the role of big dams in this decline. Equally important, there must also be an explicit understanding that our legacy of dams was based on an outdated development ideology that discounted or ignored ecological impacts, and their consequent societal and economic impacts.

In the next 100 years, we will no longer be trapped into more extensive and expensive attempts to mitigate the negative impacts of obsolete and poorly planned dams. Instead, we will find a way to retrofit this obsolete water management infrastructure to reflect modern societal goals, including protection of the rights of river-dependent people and river ecosystems.

Rivers mirror the ironies and struggles of the human condition and in this reflection serve as great unifiers of the human spirit. The health of a river and its watershed indicates the social health of the communities within the watershed. The care needed to sustain these rivers and watersheds recognizes no geographic, cultural, or political boundaries, but instead demands that these boundaries be crossed and divisions put aside. In the next century, we envision a return to health of both our rivers and the communities that depend upon them – that is to say, all of our communities.

Juliette Majot is the executive director of IRN, and Phil Williams is IRN's president.

A New Water World

by Sandra Postel

 The world's use and management of water is likely to change more during the next 50 years than it has in the last 1,000 years. For most of human history, our challenge has been how to access and control ever greater quantities of water in order to meet rising human demands. During the latter decades of the 20th century, we began to see more clearly the limitations and the costs – social, economic, and ecological – of this approach. Although there are still powerful interests trying to perpetuate the old supply-side approaches, there is wider recognition that striving to continuously expand the supply of a finite resource is ultimately a losing proposition – one that leads to diminishing returns and, in some cases, negative net benefits.

Fortunately, opportunity is knocking loudly on another door. The new and exciting frontier in water management is increasing water productivity – getting more benefit or service out of each gallon of water we remove from Nature. Rather than asking how we can tap more of Nature's supply for human uses, we ask how we can provide more nutrition, jobs and material items with the water supplies we already control. My analyses suggest that we will need to double water productivity over the next 30 years if we are to successfully meet the needs of eight billion people while at the same time protect the health of the aquatic environment.

This path, if we follow it, will create a very different water world. It will be a world in which highly efficient drip irrigation accounts for closer to 15 percent of global irrigated area, rather than today's one percent. Farmers will use information technologies to know precisely how much water to apply to their crops and when to apply it. Industries will have nearly complete internal water recycling, cutting pollution and water use dramati-



Quinn Whitaker was so inspired by a lecture by author Arundhati Roy about large dams in India that she changed her Halloween costume to "make a statement," becoming an Angel of Resistance in a "Free the Narmada" t-shirt and telling people she met about the problems with large dams in India.

ically. Homes and communities will replace thirsty green lawns with native landscaping, conserving water and enhancing biological diversity. And many individuals will choose to eat less meat, recognizing they can reduce the water-intensity of their diets and improve their health at the same time.

This path, as I envision it, will be guided by a water ethic – one that says enough water should be provided for all living things before some get more than enough. Society will ensure that all people have access to a minimum amount of safe drinking water, something more than one billion people lack today. We will see the creation of environmental water reserves – allocating to natural systems the quantity, quality and

timing of flows that they need to remain healthy. Engineers and ecologists will work together to devise ways for getting multiple benefits out of the same volume of water. In a nutshell, we will be more efficient, more equitable, and more creative in how we manage the water we take from Nature so that more water can be left alone to do the valuable work of Nature.

Sandra Postel is director of the Global Water Policy Project in Massachusetts, which focuses on international water issues. She is a senior fellow with Worldwatch Institute, and author of Pillar of Sand: Can the Irrigation Miracle Last? (1999) and Last Oasis (1997).

A Child's Dreams

by Quinn J. Whitaker (age 11)

 In the new millennium I think that someone will, or should, make more river preserves. There are lots of places that preserve animals and land, shouldn't there be lots of ways to preserve rivers? They could be places where people could come and see the rivers unchanged.

I also think that environmental education projects like River of Words will be used in classrooms all over the world for every age group, and that every teacher will have the curriculum and use it to teach the children to respect and care for their rivers and wildlife. They will help children to unlearn what they might have heard their parents or others saying about it being OK to change rivers or about the benefits of big dams.

And then maybe kids could go into the wild and visit their rivers and come up with their own ideas of what it means for a river to run free and how people could generate power some other way than by harming rivers. If they had this knowledge, they could teach the older generation about rivers and how to care for them. ■

Living Rivers continued from page 7

hatcheries are not working very well, and we also see attempts to restore landscapes without restoring physical processes. Examples are attempts to restore floodplain forests that are no longer inundated by floods, or efforts to create artificial fish-spawning channels without necessary scour-

ing flows, which clean out spawning gravel of sediment.

It has taken us a long time to recognize that the essential processes which need to be restored are those that sustain the life of the river; the vigor of its flow, its flood-flow pulse, and its lifeblood, sediment. These are the processes most affected by large dams.

Our conceptual model of a living river leads us to a meaningful approach to restoration. We can progressively remove or limit human interventions such as dams so that the river can restore itself. Practically, this means re-establishing the seasonal and annual variation in flow, in particular the

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A New Course for Water Policy

by Bruce Babbitt

US Secretary of the Interior Bruce Babbitt gave the dam-decommissioning movement a boost with his 1998 “sledgehammer tour” to remove a handful of harmful dams around the US. In this exclusive to WRR, he talks about US water policy for the future.

Like a great river on the land, American water policy is continually moving and changing course, meandering in one direction and then another, eroding one bank while building from the other, always seeking new channels of expression. Occasionally, however, rivers overflow their banks and abandon old channels to cut a new course, a process known to hydrologists as *avulsion*.

Our national water resource policy is now undergoing an avulsive change, breaking from the past and heading into new channels. Traditional national water policy was characterized by large water diversion projects, typically with a massive dam as the centerpiece. Hoover Dam, a shining white colossus wedged deep in Black Canyon on the Colorado River, is the prototype. Completed in 1935, it was both an architectural wonder and an engineering triumph: it watered and electrified the river basin, created tens of thousands of construction jobs, and helped pull America out of the Great Depression. Its success continues to inspire river development and dam building across the country and around the world.

Back when Hoover Dam was built, no one paid much attention to the enormous ecological costs of these monstrous development projects. When Hoover's gates closed, the vast delta wetlands at the mouth of the Colorado River in Mexico were transformed into barren salt flats. A series of large dams on the Columbia River created a string of slack-water pools, destroying thousands of miles of spawning habitat, blocking fish passage and sending salmon stocks crashing toward extinction. On other rivers, huge wedges of sediment piled up behind dams, making them obsolete almost as soon as they were completed.

We are finding new and better ways to meet water needs without destroying fish runs, flooding prime agricultural lands, displacing local communities and drying up and polluting downstream wetlands. Our new water policy takes account of these ecological costs and seeks to wean policymakers

from an addiction to dam building. It rejects traditional “supply side” water politics that lead government to keep building ever more costly and ecologically destructive projects.

The new water policy of this administration focuses on the demand side of the water equation. It emphasizes market incentives and full-cost pricing for more efficient allocation of existing supplies. Over the past decade, the Interior Department has promoted three distinctive approaches to managing existing supplies more efficiently. I think of them as three new “water holes” to be tapped.

The First Hole: Conservation

The first of these new water holes is plain old conservation and water-use efficiency. The basic problem is that in many parts of this country, we still treat water as a free commodity, equivalent to the air we breathe, to be available on demand without limit. And in the process, we waste prodigious quantities of water in our daily lives, especially in gardens and landscaping. Parts of Las Vegas look more like a Brazilian rainforest than a desert city. Much of my hometown of Phoenix has ornamental lakes and ponds that resemble Minnesota more than the Sonoran desert. In Phoenix, fully 40 percent of the limited water supply is used for watering lawns and other outdoor landscaping.

Pricing policies are demonstrably effective in cutting this excess consumption. In Tucson, also located in the Arizona desert, per capita water consumption has been cut 30% by implementation of tiered water rates which penalize heavy water consumption. In response, homeowners have turned to natural desert landscaping. In Los Angeles, the Metropolitan Water District has achieved the remarkable feat of keeping its overall water use level, even as the population it serves has grown by 32 percent in the past 25 years. Pricing policies are at the core of this, but incentives and regulations for use of water-efficient toilets, shower heads and other appliances have also played a role.

In the American West, irrigated agriculture uses more than 80 percent of the developed water supply. That means, for example, that in California just a five percent reduction in irrigation water use would provide enough water to supply ten million new urban residents. And there is no lack of technology to achieve the modest savings necessary to free up this water for urban growth.

Down at the southern end of California's San Joaquin Valley, a visitor can see miles of almond orchards blossoming in the spring sun against a backdrop of high desert mountains. There is no water visible to sustain these verdant landscapes, but look closely and you will see miles of black plastic tubing, about the diameter of a garden hose, strung along the rows of trees. This is drip irrigation, whose tubes not only cut water use by 80 percent, they are also an efficient way to deliver precise amounts of nutrients dissolved into the water supply.

The second new water hole consists of the use of “water markets” to allocate existing water supplies by market transactions between water users. Water markets encourage the owners of water rights to sell to other users willing to pay a high enough price to make it an advantageous transaction for both parties.

The effect of marketing is to move water supplies from lower value to higher value crops and to move some water from agriculture to urban uses. Water markets have been slow to develop. The ironic reason is that in America, the mecca of free markets, water is traditionally a government monopoly, unresponsive to efficient allocation. Traditionally, the bureaucratic response to water shortages is to create more subsidies to build still more dams to perpetuate the system.

The Interior Department encourages and facilitates water markets and transfers whenever possible. Recently, the city of San Diego, located in a rapidly growing region of southern California, began to look for new water supplies. Rather than planning yet another river diversion, it looked to the nearby Imperial Valley, a huge inland valley irrigated with two million acre feet of water from the nearby Colorado River. After protracted negotiations with the farmers and irrigation districts mediated by the Interior Department, San Diego has struck a deal to purchase up to 200,000 acre feet of water for future urban growth. Most of this Imperial

continued opposite



Photo: Mark Volkoff

Bruce Babbitt on a dam-busting tour.

Valley water will come from conservation and irrigation efficiency improvements, financed from a portion of the sale proceeds.

But the west can have long droughts; doesn't this mean that we must have huge amounts of storage? That takes us to the third undeveloped water hole: groundwater storage.

In the not-too-distant past, the response to all water supply problems was to build big, river-killing dams. Never mind that surface storage is not very efficient – Hoover Dam's reservoir loses a million acre feet per year to evaporation, as does Glen Canyon's reservoir. This is more than ten percent of the average flow of the Colorado River, enough to supply a city the size of Los Angeles.

Although some water storage is necessary in most regions, a better alternative to dams is to store water beneath the ground by recharging depleted groundwater basins. When rivers have surplus flood flows, the water can be drawn off and stored without the destructive consequences of building dams.

One of the largest of these projects, the Kern County water bank in California, stores and retrieves more than a million acre feet of water per year. This water bank contains a mosaic of shallow ponds and dikes on the desert floor where water is infiltrated into the underground aquifers. When I visited the area, the small lakes were alive with waterfowl, shorebirds and marsh hawks cruising above the water – an artificial wildlife refuge

and proof that with imagination we can meet our water requirements in a less destructive, environmentally friendly manner.

Even more recently the Department has issued regulations which will permit Las Vegas, Nevada, to store high flows on the Colorado River in a groundwater bank located across the river in Arizona, with Arizona providing credits to Nevada for direct use of Arizona's Colorado River water in times of low flow. It's a complicated arrangement, necessitated by the absence of major aquifers in southern Nevada and complex provisions in the interstate compact governing allocation of the waters of the Colorado. But the arrangement demonstrates, in all its complexity, the broad range of alternatives to pouring more concrete and disfiguring more rivers with dams.

Restoration & Restitution

It is not sufficient, however, just to oppose new and destructive dams and river diversion schemes. We must act to modify the sad legacy of rivers without water, ruined delta wetlands, and declining fisheries. We must bring a measure of restitution to the human victims of dam building such as the Nez Perce, the Yakama and other Native Americans whose traditional cultures and livelihood, organized around harvests of the Columbia River's great chinook salmon runs, have been devastated by river develop-

ment projects. Our task for the coming century will be to remove dams and to restore rivers and wetlands that have been destroyed in the age of dam building, dredging and diversion.

In some cases the best prescription for river restoration is simply to tear down the dam that is causing the problem. Last December I took a sledgehammer to the Quaker Neck Dam on the Neuse River in North Carolina. As dams go, the Quaker Neck isn't much; it's only six feet high and it doesn't generate much power. But to the American shad trying to spawn upstream, that six feet might as well be six hundred, blocking off 900 miles of upstream spawning waters. Now biologists and engineers have figured out an alternative water diversion method and the dam has come down. And, just a year later, the shad are spawning 70 miles upstream all the way to the city of Raleigh.

Onward to the Kennebec River in Maine where I joined Governor King and local officials in Augusta to commence removal of Edwards Dam. Standing on the river bank, we could see the dam upriver, a stone and timber structure built back in 1837 at the start of the Industrial Revolution. On the bank above the dam, we could see the brick skeleton of the long abandoned textile mill. In the river below the striped bass were swimming hopelessly in circles searching for a way through the dam. An osprey circled overhead then plunged into the waters to scoop up a stranded fish.

The textile mills were eventually abandoned, but the Edwards Dam refused to die. It was converted to produce electricity that powered the first electric lights in Augusta. But by 1997 the dam was producing less than half of one percent of the power used by the city. Residents began asking the inevitable question: Is that trickle of electric power worth the destruction of the legendary runs of Atlantic salmon, stripers and six other species of migratory fish? And now, after 157 years, Edwards Dam is coming down.

Each stop on these dam-busting tours stirs enormous local, regional and national attention. And I always wonder, what is it about the sound of a sledgehammer on concrete that evokes such a reaction? We routinely demolish buildings that have served their purpose. Why not dams? Why not continue the search for new ways to live in harmony with creation? ■

Anti-Dam continued from page 5

But the Gujarat government remained committed to completing Sardar Sarovar and scraped together the money to continue construction. Large-scale submergence began during the 1993 monsoon. Police arrested those in the lowest houses and dragged them to higher ground. Similar scenes were repeated in 1994 and 1995.

Construction on the dam was finally halted in early 1995 after the NBA filed a case with the Indian Supreme Court. But in 1999 the Gujarat government persuaded the court to allow the dam to be raised by several meters. This small addition caused a major increase in the area flooded. Villagers and activists once more took up the pledge to face the rising waters. The reservoir rose into houses three times in 1999. At press time, construction is suspended once again and the NBA is preparing for another Supreme Court hearing and its long-awaited final judgment.

During the 1990s the NBA also helped organize villagers affected by other dams in the Narmada Valley. In January, the Maheshwar dam site was taken over by local villagers for the eighth time in three years.

Author Arundhati Roy says the NBA's struggle "has come to represent far more than the fight for one river. It has begun to raise doubts about an entire political system. What is at issue now is the very nature of our democracy. Who owns this land? Who owns its rivers? Its forests? Its fish?"

Today, Indian anti-dam activists are increasingly focusing attention on ways to provide irrigation and drinking water which do not rely on large dams. Dozens of ingenious ways to capture water without river-killing reservoirs in the 1997 book *Dying Wisdom: Rise, Fall and Potential of India's Traditional Water-Harvesting Schemes*. NGOs around the country are working with communities to reinvigorate water harvesting systems.

Researchers have also debunked the powerful myth that large dams are essential to India's food self-sufficiency. Himanshu Thakker of the Centre for Water Policy has shown that despite billions of dollars in investments, only 13 percent at most of India's food production is due to irrigation from large dams. A team of energy experts have shown that improving India's energy efficiency could fulfill all the country's power demand for the next decade without the need for new supply.

Brazil: Acting Locally and Globally

Effective opposition to dams in Brazil first arose after the national utility Eletrosul revealed plans in 1977 to build 22 dams in the Uruguay River basin. Over the next few

years, priests, union organizers, land reform activists and small farmers started to mobilize resistance to the first dams slated for construction, Itá and Machadinho. In 1981, the Regional Commission of People Affected by Dams (CRAB) was formed.

Through the political acumen of its leadership and by forging alliances with other social movements, CRAB forced Eletrosul to the negotiating table. The group's demands were backed by non-violent direct action: company representatives were thrown off private land, survey stakes torn up, construction sites blocked, and offices occupied.

By 1987, CRAB had forced Eletrosul to make significant resettlement concessions. CRAB's resistance helped cause long delays in the construction of Itá and forced Eletrosul to redesign Machadinho with a smaller reservoir and less displacement.

In 1991, regional groups of dam-affected people from around Brazil formed the National Movement of People Affected by Dams (MAB). MAB's stated goals were to ensure justice for affected people and to secure "profound changes in current energy and irrigation policies." Today MAB is demanding that no licenses be given for new dams until reparations are provided for those yet to be compensated for damages caused by existing dams. MAB is also lobbying the government to set up a national commission on dams to review the country's dam-building record.

Realizing the need to organize on the international level to counter the influence of international funders and builders of dams in Brazil, MAB organized the First International Meeting of Dam Affected People, held in Curitiba, Brazil, in 1997. People from 20 countries attended. MAB also played a leading role in pushing for the establishment of the World Commission on Dams.

Thailand: Standing Up to Dams

The Japanese-financed feasibility study for the Nam Choan Dam on the Khwae River was completed in 1982. The World Bank and Japanese government pledged funds to build what would be the country's highest dam. The Thai electric utility, EGAT, insisted that although the reservoir would cut through the Thung Yai Wildlife Sanctuary, only a small part of the sanctuary would be flooded. It also claimed the area would soon be destroyed by illegal farming and logging.

The dam was opposed by a network of environmentalists, academics, students and others, which countered that the wildlife sanctuary was the core of the largest contiguous expanse of natural forest remaining in Southeast Asia. The reservoir would block migration routes for large mammals, and

"It is both necessary and possible to bring an end to the era of destructive dams. It is also both necessary and possible to implement alternative ways of providing energy and managing our freshwaters which are equitable, sustainable and effective."
Dam-affected signatories of the
Curitiba Declaration (1997)

flood hugely diverse riverine forest. Critics accused EGAT of deliberately exaggerating local rainfall and thus power production. For the same investment, opponents argued, an equivalent amount of energy could be generated by upgrading existing power plants. The outcry over the project forced the government to suspend Nam Choan.

When the project came back to life some years later, a broad base of citizens and a growing number of politicians joined the ranks of the opposition. Numerous protests were held. The anti-dam groups worked not just on the local and national levels, but also built up strong links with the international environmental movement. In 1988, the project was finally shelved. Soon after, the wildlife sanctuary was granted World Heritage Site status.

The lessons learned and alliances forged in the Nam Choan campaign propelled Thai environmentalists to other successes, most notably a 1989 nationwide ban on logging. Student groups and NGOs helped local people force the cancellation or postponement of three large dams in the three years after the Nam Choan decision.

Pak Mun Dam, which provoked the most bitter struggle since Nam Choan, did get built. But the affected people's years-long fight for adequate compensation, and the resulting negative publicity for EGAT, helped bring an end to the utility's dam-building days. In 1995, the Prime Minister's Office declared that "for the sake of environmental protection, [Thailand would] no longer build dams for power production." Today, people affected by Pak Mun are still fighting for reparations.

US: Dam Decommissioning

When Dan Beard, former head of the US Bureau of Reclamation, stated in 1994, "The dam building era in the United States is now over," he set off a uniquely top-down move-

continued opposite

ment against dams in the US. This sea-change took an even more tangible turn in 1998 when Bruce Babbitt, head of the US Department of the Interior, embarked on a nationwide “sledgehammer tour” to remove small, aging dams that had particularly negative impacts on fisheries. The tour highlighted a growing nationwide movement to decommission dams in the second-most-dammed country in the world (after China).

Nearly 500 dams were removed in the US in the 20th century, from small to large. Although that leaves more than 75,000 dams still clogging the nation’s rivers, the pace of decommissioning has stepped up in recent years and more groups have gotten involved. The US has active campaigns to decommission more than 100 dams. Nearly all of these efforts are characterized by unique partnerships that bring together river-protection groups, fisheries experts, local politicians, citizens, and scientists from agencies such as US Fish and Wildlife and US Army Corps of Engineers. In some places, government agencies have been key players in getting dams removed or re-operated. In Pennsylvania, for example, 35 dams have been removed since 1990, and as many slated for removal within two years – an effort largely spearheaded by the Pennsylvania Fish and Boat Commission. Some partnerships have even included dam owners who have discovered that it can be more economical to decommission dams than to re-operate or repair them to meet safety or environmental standards.

In Wisconsin, advocacy groups, scientists and agencies such as the Department of Natural Resources have come together to maximize restoration opportunities in a state with some 3,600 dams wreaking environmental havoc. One such effort is the dam removal campaign “20 by 2000,” launched by the River Alliance of Wisconsin. The Alliance offered technical expertise to communities that wanted to remove dams. By the end of 2000, at least 20 dams in six communities will have been removed or slated for removal through this campaign. The Alliance is now working on a Citizen’s Guide to Small Dam Removal.

Friends of the Earth launched one of the first major decommissioning efforts in the world in Washington state during the mid-1980s. After an eight-year campaign by conservationists, fishermen, and Native Americans, Congress agreed in 1992 to allow two large dams on the Elwha River to be removed. The Congressional agreement is subject to the appropriation of funds, which has been blocked by a Washington senator. An agreement to take at least one of the dams out is currently moving forward.



Photo: Roberto Epple

A dam on the Loire in France was removed by force in 1998.

The Colombia/Snake River basin is another hotbed of dam-decommissioning activity, with some of the most politicized decommissioning battles in the country. These efforts have drawn large national environmental groups, such as American Rivers and Friends of the Earth, as well as smaller groups such as Idaho Rivers United. Tribal peoples are also weighing in on some of these efforts, as their fisheries, often protected by treaty rights, have been destroyed by years of damming.

The idea to restore fisheries on the Snake River (a tributary of the Columbia) through decommissioning first came from an unlikely source – the US Army Corps of Engineers, which has had a long history of trying to “tame” rivers with dams and levees. Since the agency revealed in a ground-breaking report that the Snake’s fisheries could best be restored through decommissioning some dams, environmental groups have worked to make the river’s restoration a reality. A coalition called the Columbia and Snake River Campaign is seeking the partial removal of four dams on the lower Snake and the permanent lowering of the reservoir behind a

dam on the Columbia to restore endangered fish species. The coalition has financed technical studies, including a report which reveals that decommissioning these dams would save the public US\$87 million a year, by ending failed efforts to restore salmon and subsidies for river transportation.

Some of the most exciting decommissioning efforts in the US involve taking on the dams that submerged Hetch Hetchy Valley in Yosemite National Park, and Glen Canyon Dam on the Colorado River. Today there are campaigns to restore the rivers below each of these dams, probably by allowing water to flow through an altered dam wall. The Sierra Club spearheads the Hetch Hetchy campaign, and hopes to build political will to restore this “other Yosemite Valley.” The Glen Canyon effort includes the research-oriented Glen Canyon Institute, and the new Glen Canyon Action Network (www.drainit.org), recently launched by IRN’s former director, Owen Lammers. GCAN’s goal is to drain the reservoir and restore the beautiful desert canyons to their pre-dam state.

The US is not alone in its efforts to take down bad dams. The European Rivers Network in France has successfully pushed for the removal on dams on the Loire. Thailand’s Pak Mun resettlers are demanding that the dam be removed if project officials cannot restore their livelihoods. In Japan, groups that fought a dam on the Nagara River have begun a campaign to decommission the Nagara Estuary Dam. And the extensive people’s movement in Latin America is considering dam decommissioning for a number of projects. If the anti-dam movement’s successes in the past are any indication, the 21st century could be an era of serious dam removal. ■

“Men may dam it and say that they have made a lake, but it will still be a river. It will keep its nature and bide its time, like a caged animal alert for the slightest opening. In time, it will have its way; the dam, like the ancient cliffs, will be carried away piecemeal in the currents.”

Wendell Berry

Thousands Relocated for Proposed Burma Dam

by Edith T. Mirante

Tens of thousands of people have already been relocated in Shan State, Burma, to make way for a proposed dam on the Salween River. The 3,300 MW Ta Sang Dam would export power to Thailand and supply power to Burma. While currently only at the design stage, the Burmese military dictatorship, which calls itself the State Peace and Development Council (SPDC), is using the project as an excuse to relocate ethnic minority Shan people living along the Salween River.

The Salween River, known as the Nu Jiang in China, rushes in a cold, wild torrent from its source on the Tibetan Plateau through China's Yunnan Province and then through Burma to the Indian Ocean. It has been little studied, but it is known that the Salween basin still harbors some of Southeast Asia's remaining intact forests, which support rare animals and medicinal plants. A piece of the Salween forms part of the border between Burma and Thailand.

In the early 1990s, preliminary studies were done for several Salween dams but the plans never attracted funders. The World Bank and International Monetary Fund do not lend to Burma's military regime, and the Asian Development Bank did not follow through on its initial enthusiasm for proposed Burmese dam projects. However, recent moves by the Japanese government to reestablish ties with the SPDC has led to fears that the Japanese government may finance the Ta Sang and other proposed dams along the Salween.

In July 1997, the Thai government agreed to buy up to 1,500 MW of power from Burma by 2010. Two months later, GMS Power – a subsidiary of Thailand's MDX group of companies – signed a contract with the military government's Myanmar Economic Corporation to conduct a feasibility study on Ta Sang. GMS Power is involved in dam projects in Laos, Cambodia and China. GMS contracted Lahmeyer International, a German consulting firm, to conduct a prefeasibility study, and the Electric Power Development Corporation of Japan to oversee the feasibility study (completed in March 1999). The final stage of the study, scheduled to begin in December 1999, has been described by a GMS spokesperson as the "definite plan," presumably the detailed engineering design.

The GMS and EPDC surveyors and seismic technicians began their field visits in

November 1998, accompanied by heavily armed Burmese army guards. The area is contested by Shan rebels, who have been fighting the Burmese military for autonomy for decades. Burma's regime has countered such insurgency with ruthless campaigns against the civilian population of the region. According to the Shan Human Rights Foundation, hundreds of villages in Shan State have been destroyed and at least 300,000 inhabitants relocated to fenced camps and new villages near army bases, where they are forced into labor on the regime's infrastructure projects.

Leaders of Shan rebels active in the Ta Sang area gave permission for the GMS-EPDC team to conduct its study there. However, the Shan rebels have reserved judgment as to whether or not to allow actual dam construction without a fight. Seng Suk, a Shan rebel leader, commented in January about GMS/EPDC, "They are looking to carry out this project without taking into consideration the huge human cost."

No Environmental Protections

The Ta Sang Dam will be 188 meters high and would create a reservoir 230 km long, storing approximately one-third of the Salween's average annual flow. The project would do considerable harm to the people and environment of the Salween basin, especially in Burma. Burma is essentially without environmental regulation, which has left it utterly vulnerable to the predations of the foreign logging, mining and petroleum companies invited in by the ruling junta. No environmental impact assessments have been done for the dams already built or planned in Burma.

According to Salween Watch, a coalition of organizations opposing the project, "Indigenous fish populations and land-based wildlife would be radically affected or annihilated. Riversides would be completely changed all the way down to the delta, with riverbank erosion and possible disappearance of islands in the delta. Some well-water supplies would likely be affected by saltwater intrusion. Deprived of riverborne silt, farming in the highly productive floodplains would come to rely increasingly on scarce and expensive chemical inputs."

In addition to Ta Sang, preliminary studies have been completed for five hydropower dams on the Salween. In February 1999, the

Thai government approved US\$4.6 million for a feasibility study of diverting water from the Salween basin into the Chao Phraya River basin in Thailand, to alleviate Thai water shortages.

These plans have met strong resistance from Thai and Burmese villagers and NGOs, who estimate that more than 10 million people would be affected by dams on the Salween. In September 1999, over 35 Thai and Burmese organizations signed an open letter warning that any damming of the Salween "would drown villages, disrupt agriculture and fisheries above and below the dam ... [and] be a grave hazard in an area that frequently experiences earthquakes." The letter called for a process of consultation that "fully recognizes and respects the human, civil and political rights of all the affected peoples, ensuring their informed participation and fully compensating them for any losses incurred."

Many Thai activists see a parallel between the Salween dams and the Yadana gas pipeline that was built in recent years across Burma by multinational companies Total and Unocal, to fuel electrical power for Thailand. The pipeline route was deforested, villages in the vicinity were relocated, and insurgent groups were crushed to secure the area for construction. Today, Thailand has more energy than it can use, and the pipeline is barely functioning.

Burma's pipeline tragedy shows that immense damage can be done by a project before it is "on-line." Indeed, harm can occur before the project has even officially commenced, as the Burmese regime moves its battalions in to thoroughly secure a region for the grand schemes of moneyed interests. The indigenous people of Burma are not consulted about these projects, and in fact their very existence is viewed by the regime and its investors as an impediment. Burma's military acts accordingly, to remove the people and use them as beasts of burden. As Salween Watch puts it, "Making a huge dam in the land of the Shan people is an act of neo-colonial occupation, if not an act of war." ■

The author is director of Project Maje, an environmental and human rights information project on Burma, and author of Burmese Looking Glass (Atlantic Monthly Press). For further information contact Salween Watch: Salween_Watch@hotmail.com.

Indigenous People March to Bogotá to Protest Urra Dam Impacts

by Monti Aguirre

Hail and hard rain fell over Bogotá, Colombia on January 3, flooding the gardens at the Ministry of the Environment where 167 Embera-Katio people had been camping out for almost three weeks. The protest vigil is part of the people's effort to push the government to negotiate with them over the impacts of the US\$780 million Urrá Dam.

Men, women, children, elders and medicine men marched 700 km from the Upper Sinú River to Bogotá, to protest the flooding of their lands and to focus attention on their struggle to protect their rights to livelihood. The protestors were soon joined by members of the fishing communities living downstream from the dam site, also demanding mitigation measures for the dam's impacts.

In December, a few weeks after the vigil began, the government conceded one of the Embera-Katio's demands, agreeing to keep the reservoir level below where it would flood people off their land. Since then, officials have been reluctant to meet with the protestors, reportedly fearing being forced into other concessions which could influence how future development schemes play out.

Back in their traditional lands, another group of over 100 Embera-Katio launched an indefinite occupation of their territory which will be flooded. 46 traditional homes were rapidly built in this area and people began preparing the field for cultivation. They vow to drown if their demands are not met.

The project would flood 470 hectares of the Embera-Katio territory. Urrá S.A., the owner of the dam, suspended negotiations with the Embera-Katio in September. Nevertheless, the government granted the environmental license and in November the company began filling the reservoir. These actions violated the Constitutional Court's ruling of suspension of the project until an adequate mitigation and compensation plan was agreed upon between the Embera-Katio and Urrá.

Although legally Indian lands are communally owned property, the company negotiated a compensation and resettlement package with individuals from the Esmeralda Reserve, which has caused division among the people. The protestors are pushing to halt such individual negotiations.

Construction of the Urrá Dam has caused serious impacts throughout the Sinú River

basin. The dam has impacted fish populations, flooded fields and disrupted navigation. Communities downstream from the dam have reported that the Lorica wetlands are drying out, harming fish breeding grounds and habitat for other animals.

The Urrá Dam was built with financing from the Nordic Investment Bank, the Canadian Export Development Corporation, Nordbanken and the Colombian government. Urrá S.A. contracted Swedish company Skanska to build the dam.

The Embera-Katio's efforts to negotiate with Urrá and the government have not just met with official indifference, but also with paramilitary violence. Since August 1998, four Embera-Katio leaders have been killed.

"We are not going to leave our land, because the government has not come to an agreement with us. Urrá officials do not have the authority to use our lands or flood them. Our bones are buried there," said the Embera-Katio in a written statement. ■

For more information: In Spanish, www.gratisweb.com/embera_katio/index.htm; In English: www.irn.org

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smaller floods that do most of the work in scouring and depositing sediments; inundating and replenishing floodplain woodlands and farmland, and re-watering aquifers and wetlands. It also means reestablishing a way for the river sediments to move downstream.

An Obsolete Legacy

An equally important question of the 21st century is, How do we retrofit obsolete water management infrastructure to reflect modern societal goals? These goals now include protecting the rights and values of river dependent people, protecting the river ecosystem, and ensuring economic accountability for river management decisions. In order to answer this question we need to change our view of the dam as an everlasting concrete structure, to the dam as a continued human decision to perpetuate a certain type of intervention on a healthy living river.

One way to begin to restore rivers to life would be to conduct a periodic audit of existing dams, to reevaluate the rationale for their continued operation. This audit would be similar to a relicensing process used on private dams in the US. It would include an environmental and social assessment of pro-

jected future operations and determine whether the dam will meet contemporary societal goals. From such an audit, decisions can be made to continue a dam in operation, modify its operation or decommission it.

This process would lay the groundwork for a new direction in river management. Instead of being trapped into more and more extensive and expensive attempts to mitigate the ever-expanding negative impacts of obsolete poorly planned dams, we would have the freedom and opportunity to realize the cumulative social and ecological benefits of restoring and managing our river valleys.

For those dams we decide to continue operating, we have to place their rivers on permanent life support. This means developing new reservoir operations and river management regimes that mimic natural hydrologic processes. We have a pretty good idea of what they are. To achieve them may require making significant changes in flood-control operation and even retrofitting dam structures with new spillways, but these changes could significantly improve flood protection while restoring river corridor and wetland ecosystems. New reservoir-operating criteria will require fair evaluation of the tradeoffs between irrigation

deliveries and ecosystem restoration. To do this requires first establishing a transparent and rigorous accounting system for how we manage our water resources.

But even this does not treat the "whole body" of the river. Once we free ourselves from the legacy of engineering decisions made 60 years ago, we have the opportunity to realize the cumulative societal, economic and ecologic benefits of large-scale restoration. For example, we know that restoring lowland river floodplains will not only reduce flood damages, but help recharge groundwater, preserve greenbelts, and provide recreational benefits.

It is possible to envisage a future where rivers and water resources are managed in harmony to sustain a viable ecosystem and a modern economy. To get there, we have to first break free from the legacy of greed and bad planning that imposed big dams on our rivers. We need to articulate a clear, comprehensive and scientifically defensible vision for river management. And we need to begin taking bad dams down. ■

The author is president of International Rivers Network and a consulting hydrologist.

Join the International Day of Action Against Dams

by Susanne Wong

Over the past year, the anti-dam movement has gained huge momentum – from nonviolent mass resistance in Asia, to unprecedented networking in Latin America and Africa, to dam removals in Europe and North America. Let's keep this momentum growing: plan an event on March 14 as part of the third annual International Day of Action Against Dams and for Rivers, Water & Life.

Actions on this day show the world a strong, diverse worldwide movement dedicated to the health of rivers and the people that depend on them. The Day of Action also helps publicize the need for more equitable and sustainable ways to manage our rivers.

As the movement grows, so does the number of groups fighting for reparations. Reparations are measures taken to compensate people for damages caused by existing dams. Worldwide, people are demanding that financial institutions and dam builders not be let off the hook once a project is completed. Let's work together to send institutions and dam builders our message.

Another exciting trend is the growing movement to decommission dams. In the US

and France, governments and dam-building agencies have acknowledged that the era of big dam-building is over, and are starting to tear dams down. Dams do not last forever. It's time to create a new vision for managing our rivers for the next millennium.

It is also time to push policy makers to implement more sustainable solutions for meeting water, flood management and energy needs. Day of Action events are a good way to spread the word about demand-management strategies for water and energy, and true renewables such as solar and wind energy.

Here are just a few examples of actions organized in the past around these themes:

Reparations

- In Brazil, people affected by Serra da Mesa dam in Goiás state held a meeting to demand proper compensation and resettlement. Another Brazilian action involved taking over the utility company's headquarters to demand better compensation on the Itaparica project.
- People affected by India's Koyna Dam – built nearly 40 years ago – organized a

protest to demand just rehabilitation and no further displacement.

Decommissioning

- The "Let's Help the River Volga" Coordination Center in Russia started negotiations with the Committee for Water Resources regarding joint actions to demolish small dams in Nizhni Novgorod Province.

Alternatives

- Representatives from 300 ecology groups in Spain met to decide on collective campaigns and strategies regarding the country's water policies and management.
- Slovakian activists demonstrated against flood control dams for which a better alternative would be to reforest heavily clearcut watersheds.

Reparations, decommissioning and alternatives are just some of the many issues around which to organize your event. Please join us on March 14. ■

For more information, contact Susanne Wong: swong@irn.org, or visit the IRN web site: www.irn.org/dayofaction

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