

WORLD•WATCH

WORKING FOR A SUSTAINABLE FUTURE

Liberating the Rivers

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All the Wild Rivers

In the United States, the number of dams being torn down now outnumbers those being built. Elsewhere as well, people are having second thoughts about the great 20th-century enthusiasm for controlling and harnessing rivers.

by Curtis Runyan

In 1966, Floyd Dominy, the commissioner of the U.S. Bureau of Reclamation, gave a speech lambasting environmentalists for their opposition to damming up the Grand Canyon national park. If the dams were not built, he told the audience, the Colorado River would be “useless to anyone.” Dominy, head of the agency that led the charge in the United States’ rush to dam up its rivers, concluded: “I’ve seen all the wild rivers I ever want to see.”

Thirty years later, in 1998, Bruce Babbitt, the U.S. Secretary of the Interior, traveled across the country to several rivers on a “Sledgehammer tour”—not to break ground on new construction, but to tear four dams down. “America overshot the mark in our dam building frenzy,” he said in a speech to the Ecological Society of America. “For most of this century, politicians have eagerly rushed in, amidst cheering crowds, to claim credit for the construction of 75,000 dams all across America. Think about that number. That means we have been building, on average, one large dam a day, every single day, since the Declaration of Independence. Many of these dams have become monuments, expected to last forever. You could say forever just got a lot shorter.”

One of the world leaders in building new dams, the United States, is now leading the world in tearing them down. The country is now decommissioning more large dams than it builds each year, and has removed at least 465 of them, according to a study by American Rivers, Friends of the Earth, and Trout Unlimited. France and other countries are following suit. “It’s striking how, in just two or three decades, the U.S. has gone from building dams to not building dams to taking some of them down,” wrote Marc Reisner, author of *Cadillac Desert*, in the Earth Day 2000 edition of *Time* magazine. “What we’re just beginning to understand is how water development has, like nuclear energy, amounted to a Faustian bargain between civilization and the natural world.”

Ecologically, rivers are under siege. They are being drained, diverted, polluted, and blocked at a rate that has degraded freshwater ecosystems worldwide. With more than half of the world’s rivers stopped up by at least one large dam (over 15 meters high), dams have played a significant role in destabilizing riverine ecology. For example, at least one fifth of the world’s freshwater fish are now endangered or extinct. In addition, reservoirs behind dams have

flooded vast amounts of the world’s most fertile agricultural and forest land. Reservoirs also trap the sediment loads of rivers, reduce the supply of nutrients flowing downstream, release water at cooler temperatures, and disrupt healthy river ecosystems.

The ill-effects of dams are not confined to river valleys. Half of the world’s dams were built to irrigate the farmland that now provides about 12 to 16 percent of the human food supply. However, channeling water to irrigate basins without good drainage has led to extensive salinization and waterlogging of soils. Bad drainage and poorly planned irrigation—including groundwater pumping—have reduced or ended the productivity of nearly one-fifth of the world’s irrigated land.

The impact of dam building on communities has also been substantial. An estimated 40 to 80 million people have been physically displaced by the construction of dams. They have been flooded out, forced to move. One of the world’s most massive engineering projects, the Three Gorges Dam in China, if completed could force the reloca-



U.S. Secretary of the Interior Bruce Babbitt on his Sledgehammer tour “decommissions” the McPherrin Dam on Butte Creek in California. The McPherrin family was in attendance, and the dam was replaced with an irrigation pump. The following season, 20,000 Pacific salmon swam upstream. Photograph courtesy U.S. Department of the Interior, Bureau of Reclamation.

tion of nearly 2 million people. Most frequently, the people affected are not those who receive the irrigation, electricity, or other benefits provided by dams. In fact, those who are resettled have rarely ever seen their livelihoods restored. “The poor, other vulnerable groups, and future generations are likely to bear a disproportionate share the social and environmental costs of large dam projects without gaining a commensurate share of the economic benefits,” finds the World Commission on Dams (WCD), an independent, collaborative body consisting of dam construction industry representatives, anti-dam activists, and government officials, among others. The commission released its landmark report in November 2000, providing one of the first global surveys of dams with input from both supporters and critics.

The U.S. effort to consider dam removal or breaching is only part of a worldwide shift in thinking about dams. (See “Stream of Consciousness,” page 36.) In almost every country in the world, the number of new dams being built is plummeting. Ninety-one large dams were built in the 1970s in Brazil, for instance. The number built dropped to 60 in the 1980s, and to 28 in the first six years of the 1990s (see graph below). Even where dams continue to be built, public acceptance is waning, says Owen Lammers of the Glen Canyon Action Network, an ambitious U.S. activist group pushing to tear down the massive Glen Canyon Dam in Arizona. “The number of dams being constructed is going down,” says Lammers, “while the number facing resistance and severe criticism is going up.”

Evoking the almost religious fervor with which dams have been built in the past, Prime Minister Jawaharlal Nehru called the massive concrete and earthen structures being put up around his country “the temples of modern India.” But after a half-century of being regarded as technological marvels, many of these structures are being re-

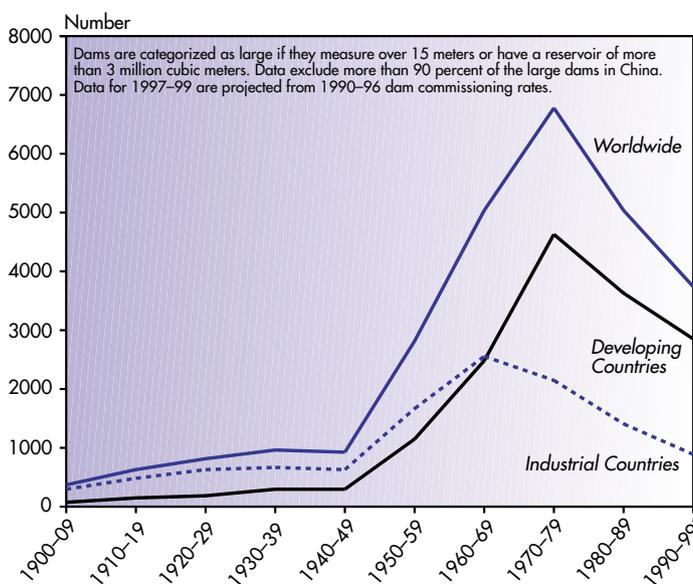
inspected and rejected as boondoggles.

Still, the number of dams and dam projects that have been stopped or removed is only a tiny fraction of those that have been built in the past half century. And projects that face strong opposition may also be getting strong support from urban residents, large-scale farmers, or other groups that stand to benefit from a dam’s construction. The Sardar Sarovar Dam on India’s Narmada River, for example, is at the center of the country’s debate over how development should occur. The Narmada Bachao Andolan (NBA), the local movement opposed to the damming, has rallied international attention against the project, which includes plans to construct 3,200 dams on the river. But despite the opposition, in October 2000 the Indian Supreme Court lifted its four-year stay on the project.

When the global rush to build dams reached its peak in the 1970s, on average two or three large dams were commissioned around the world every day. International lenders, governments, development agencies all felt they had found in dams a solution to many of the world’s development dilemmas. Dams have played an important role in addressing hunger, drought, and lack of access to clean water and electricity. They generate 19 percent of the world’s electricity supply, provide water for 30 to 40 percent of the world’s irrigated land, and in some places help to reduce floods. But the benefits of controlling unruly waterways—building dams and creating reservoirs with the aim of halting floods, expanding irrigation, providing drinking water, and supplying hydroelectric energy—have always been assumed to overwhelmingly outweigh the costs, even though little was known about what these costs were. However, as researchers conduct more studies on the effects of dams and as more of the local people who are affected are consulted, the assumption that the benefits outweigh the costs has become less certain.

Now that more than 45,000 large dams (over 15 meters high) have been built around the world, a growing body of research indicates that their costs may be higher than many ever imagined. The World Commission on Dams report finds that “In too many cases an unacceptable and often unnecessary price has been paid [to secure the benefits of dams], especially in social and environmental terms, by people displaced, by communities downstream, by taxpayers, and by the natural environment.” Irrigation schemes haven’t supplied projected revenues, hydropower dams have not met electricity-generation projections, drinking water supplies have been costly and often unreliable, and reservoirs have lost their usefulness as they fill with sediment. Recent studies have shown that the organic debris washed into reservoirs releases large amounts of greenhouse gases, raising questions as to whether hydroelectric dams really do produce clean, renewable energy. “Considering the enormous capital invested in large dams, it is surprising that substantive evaluations

Number of New Large Dams Constructed



Source: International Commission on Large Dams, *World Register of Dams*, 1998 *1997-99 projected

of project performance are few in number, narrow in scope, and poorly integrated,” finds the report.

Even the World Bank, the world’s largest international funder of dam projects (the Bank has invested \$75 billion in 538 dams), has begun to have second thoughts. “Our involvement in large dams has been decreasing and is focusing more on financing dam rehabilitation and safety and much less on financing new dams,” said World Bank President James Wolfensohn in November 2000. To put the Bank’s shift fully in perspective, however, it might be noted that while opposition to dams has been increasingly effective, the most common reason for the dramatic drop in the growth of dams is simply that many countries are already at capacity—there are fewer and fewer safe or unprotected places left to build the structures.

The jury is still out on how the World Bank, which helped instigate the dam commission, will respond to the findings of the WDC report. Wolfensohn recently told an audience of Indian business reporters that “It is unfortunate that the World Bank could not understand the depth of the water crisis in Gujarat and had to pull out of the Narmada project,” which is fiercely opposed by the NBA.

“We note and appreciate that the World Commission on Dams report vindicates many concerns raised by NGO campaigns,” announced an international coalition of more than 100 nongovernmental anti-dam activist groups in

November 2000. In many ways, the World Commission on Dams report provides an up-front review of adverse impacts that most dam projects are never subjected to. The activists contend that if the planning process proposed by the WCD had been followed in the past, many dams would never have been built. The report concludes that dam projects should require the consent of affected communities, participatory decision-making, examination of alternatives to dams, requirements to “sustain aquatic ecosystems,” and mechanisms to ensure proper reimbursement to affected communities. The coalition of activists has called for suspension of all large dam projects until countries follow the report’s recommendations for equitable, accountable, and participatory decision-making.

The debate over dams has come a long way since Dominy’s call 30 years ago to silence all the rivers. And while the thinking about dams has expanded since then, so has the number of dams that choke the world’s rivers. It is time to take the lessons learned from constructing more than 45,000 large dams around the world, and to incorporate them into our thinking about future planning for our rivers. *For more information see: The World Commission on Dams, www.dams.org*

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The Greater Common Good

India’s Acclaimed Novelist Takes on One of the World’s Largest Dam Projects

by Arundhati Roy

In the fifty years since Independence, after Nehru’s famous “Dams are the Temples of Modern India” speech (one that he grew to regret in his own lifetime), his footsoldiers threw themselves into the business of building dams with unnatural fervour. Dam-building grew to be equated with nation-building. Their enthusiasm alone should have been reason enough to make one suspicious. Not only did they build new dams and new irrigation systems, they took control of small, traditional systems that had been managed by village communities for thousands of years, and allowed them to atrophy. To compensate the loss, the government built more and more dams. Big ones, little ones, tall ones, short ones. The result of its exertions is that India now boasts of being the world’s third largest dam-builder. According to the Central Water Commission, we have three thousand six hundred dams that qualify as Big Dams, three thousand three hundred of

them built after Independence. One thousand more are under construction. Yet one-fifth of our population—200 million people—does not have safe drinking water and two-thirds—600 million—lack basic sanitation.

Big Dams started well, but have ended badly. There was a time when everybody loved them, everybody had them—the Communists, Capitalists, Christians, Muslims, Hindus, Buddhists. There was a time when Big Dams moved men to poetry. Not any longer. All over the world there is a movement growing against Big Dams.

In the First World they’re being decommissioned, blown up. The fact that they do more harm than good is no longer just conjecture. Big Dams are obsolete. They’re uncool. They’re undemocratic. They’re a Government’s way of accumulating authority (deciding who will get how much water and who will grow what where). They’re a guaranteed way of taking a farmer’s wisdom away from

him. They're a brazen means of taking water, land and irrigation away from the poor and gifting it to the rich. Their reservoirs displace huge populations of people, leaving them homeless and destitute. Ecologically, they're in the doghouse. They lay the earth to waste. They cause floods, water-logging, salinity, they spread disease. There is mounting evidence that links Big Dams to earthquakes.

Big Dams haven't really lived up to their role as the monuments of Modern Civilisation, emblems of Man's ascendancy over Nature. Monuments are supposed to be timeless, but dams have an all too finite lifetime. They last only as long as it takes Nature to fill them with silt. It's common knowledge now that Big Dams do the opposite of what their Publicity People say they do—the Local Pain for National Gain myth has been blown wide open.

For all these reasons, the dam-building industry in the First World is in trouble and out of work. So it's exported to the Third World in the name of Development Aid, along with their other waste like old weapons, superannated aircraft carriers and banned pesticides.

On the one hand, the Indian Government, every Indian Government, rails self-righteously against the First World, and on the other, actually pays to receive their gift-wrapped garbage. Aid is just another praetorian business enterprise. Like colonialism was. It has destroyed most of Africa. Bangladesh is reeling from its ministrations. We *know* all this, in numbing detail. Yet in India our leaders welcome it with slavish smiles (and make nuclear bombs to shore up their flagging self-esteem).

Over the last fifty years India has spent 870 billion rupees [\$20 billion] on the irrigation sector alone. Yet there are more drought-prone areas and more flood-prone areas today than there were in 1947. Despite the disturbing evidence of irrigation disasters, dam-induced floods and rapid disenchantment with the Green Revolution (declining yields, degraded land), the government has not commissioned a post-project evaluation of a *single one* of its 3,600 dams to gauge whether or not it has achieved what it set out to achieve, whether or not the (always phenomenal) costs were justified, or even what the costs actually were.

The government of India has detailed figures for how

many million tons of foodgrain or edible oils the country produces and how much more we produce now than we did in 1947. It can tell you how much bauxite is mined in a year or what the total surface area of the national highways adds up to. It's possible to access minute-to-minute information about the stock exchange or the value of the rupee in the world market. We know how many cricket matches we've lost on a Friday in Sharjah. It's not hard to find out how many graduates India produced, or how many men had vasectomies in any given year. But the Government of India does not have a figure for the number of people that have been displaced by dams or sacrificed in other ways at the altars of "national progress." Isn't this *astounding*? How can you measure progress if you don't know what it costs and who paid for it? How can the "market" put a price on things—food, clothes, electricity, running water—when it doesn't take into account the *real* cost of production?

According to a detailed study of 54 Large Dams done by the Indian Institute of Public Administration, the *average* number of people displaced by a Large Dam in India is 44,182. Admittedly, 54 dams out of 3,300 is not a big enough sample. But since it's all we have, let's try and do some rough arithmetic. A first draft.

To err on the side of caution, let's halve the number of people. Or, let's err on the side of *abundant* caution and take an average of just 10,000 people per Large Dam. It's an improbably low figure, I know, but ... never mind. Whip out your calculators. $3,300 \times 10,000 = 33$ million. That's what it works out to. Thirty-three *million* people. Displaced by Big Dams *alone* in the last 50 years. What about those that have been displaced by the thousands of other Development projects? In a private lecture, N.C. Saxena, Secretary to the Planning Commission, said he thought the number was in the region of 50 million (of which 40 million were displaced by dams). We daren't say so, because it isn't official. It isn't official because we daren't say so. You have to murmur it for fear of being accused of hyperbole. You have to whisper it to yourself, because it really does sound unbelievable. It *can't be*, I've been telling myself. I must have got the zeroes muddled. *It can't be true*. I barely have the courage to say it aloud.

Concrete Resistance: A Timeline of Growing Opposition to Dams

- 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. U.S. Congress passes National Reclamation Act establishing the Bureau of Reclamation and enabling big government-funded irrigation projects in western U.S.
- 1932** Dneprostroi Dam is inaugurated in the Ukraine. The world's then-largest hydropower dam, it is described by its chief engineer as "the mighty foundation of socialist construction."
- 1933** President Roosevelt establishes the Tennessee Valley Authority. By 1979, TVA has built 38 large dams and inspired numerous projects around the world.
- 1936** World's first megadam, Hoover, is completed. Elsewhere in the U.S., 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 3 dams in Chile. Subsequently, the Bank makes loans for nearly 600 dams.



The Nile has changed significantly since this engraving was made in 1884. Egypt's High Aswan Dam, completed in 1972, has had a tremendous impact, each year capturing 9.5 million tons of the rich sediment that once was deposited across the fertile Nile Delta. No longer replenished, the delta has eroded five to eight meters annually. The dam has displaced 113,000 people, and fish catches have dropped 70 percent.

To run the risk of sounding like a sixties hippie dropping acid (“It’s the System, man!”), or a paranoid schizophrenic with a persecution complex. But it *is* the System, man. What else can it be?

Fifty million people.

Go on, government, quibble. Bargain. Beat it down. Say *something*.

I feel like someone who’s just stumbled on a mass grave.

Fifty million is more than the population of Gujarat. Almost three times the population of Australia. More than three times the number of refugees that Partition created in India. Ten times the number of Palestinian refugees. The western world today is convulsed over the future of one million people who have fled from Kosovo.

A huge percentage of the displaced are tribal people (57.6 percent in the case of the Sardar Sarovar Dam). Include Dalits [“Untouchables”] and the figure becomes obscene. According to the Commissioner for Scheduled Castes and Tribes, it’s about 60 percent. If you consider that tribal people account for only 8 percent, and Dalits 15 percent, of India’s population, it opens up a whole other dimension to the story. The ethnic “otherness” of their victims takes some of the pressure off the nation builders. It’s like having an expense account. Someone else pays the bills.

People from another country. Another world. India’s poorest people are subsidizing the lifestyles of her richest.

Did I hear someone say something about the world’s biggest democracy?

What has happened to all these millions of people? Where are they now? How do they earn a living? Nobody really knows. (Recently, *The Indian Express* had an account of how tribal people displaced by the Nagarjunasagar Dam Project are selling their babies to foreign adoption agencies. The government intervened and put the babies in two public hospitals where six babies died of neglect.) When it comes to rehabilitation, the government’s priorities are clear. India does not *have* a National Rehabilitation Policy. According to the Land Acquisition Act of 1894 (amended in 1984), the Government is not legally bound to provide a displaced person anything but a cash compensation. Imagine that. A cash compensation, to be paid by an Indian government official to an illiterate tribal man (the women get nothing) in a land where even the postman demands a tip for a delivery! Most tribal people have no formal title to their land and therefore cannot claim compensation anyway. Most tribal people—or let’s say most small farmers—have as much use for money as a Supreme Court judge has for a bag of fertilizer.

The millions of displaced people don’t exist anymore.

- 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** 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 eight.
- 1961** Indian Prime Minister Jawaharlal Nehru lays the foundation stone of a dam on the Narmada River, now called Sardar Sarovar.
- 1965** Volta Reservoir, the world’s largest, starts filling behind Akosombo Dam, flooding 4 percent of Ghana and displacing 84,000 people.
- 1975** Two large dams and many smaller ones break in China’s Henan Province, killing 230,000.
- 1976** Wyoming’s Teton Dam collapses, killing 11 and causing \$1 billion in damages.
- 1981** Philippine government drops plans to dam the Chico River. The World Bank-funded plans sparked violent resistance in the region.
- 1982** Chixoy Dam in Guatemala begins to fill. Some 400 Maya are killed by government-backed paramilitary forces for resisting forced relocation.

When history is written they won't be in it. Not even as statistics. Some of them have subsequently been displaced three and four times—a dam, an artillery proof range, another dam, a uranium mine, a power project. Once they start rolling, there's no resting place. The great majority is eventually absorbed into slums on the periphery of our great cities, where it coalesces into an immense pool of cheap construction labor (that builds more projects that displace more people). True, they're not being annihilated or taken to gas chambers, but I can warrant that the quality of their accommodation is worse than in any concentration camp of the Third Reich. They're not captive, but they re-define the meaning of liberty.

And still the nightmare doesn't end. They continue to be uprooted even from their hellish hovels by government bulldozers that fan out on clean-up missions whenever elections are comfortably far away and the urban rich get twitchy about hygiene. In cities like Delhi, they run the risk of being shot by the police for shitting in public places—like three slum-dwellers were, not more than two years ago.

In the French Canadian wars of the 1770s, Lord

Amherst exterminated most of Canada's Native Indians by offering them blankets infested with the smallpox virus. Two centuries on, we of the Real India have found less obvious ways of achieving similar ends.

The millions of displaced people in India are nothing but refugees of an unacknowledged war. And we, like the citizens of White America and French Canada and Hitler's Germany, are condoning it by looking away. Why? Because we're told that it's being done for the sake of the Greater Common Good. That it's being done in the name of Progress, in the name of National Interest (which, of course, is paramount). Therefore gladly, unquestioningly, almost gratefully, we believe what we're told. We believe what it benefits us to believe.

Arundhati Roy won the Booker Prize for her 1997 novel, *The God of Small Things*. She is now working to halt India's massive Narmada dam project. This excerpt is from *The Cost of Living* by Arundhati Roy. Copyright (c) 1999 by Arundhati Roy. Reprinted by arrangement with Modern Library, a division of Random House, Inc.

Stream of Consciousness

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

by Patrick McCully

Agrowing people's movement around the world is developing 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, 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 from all over the

world. Dam builders are bemoaning its effectiveness. Wolfgang Pircher, former president of the International Commission on Large Dams, warned in 1992 that the industry 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 effi-

- 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. World Bank approves \$450 million in loans for Sardar Sarovar Dam despite the project's not having environmental clearance from the Indian government.
- 1986** To avoid apartheid sanctions, the World Bank arranges offshore financing to launch the Lesotho Highlands Water Project to bring water to South Africa. U.S. Congress passes an act requiring greater economic accountability for federal dams, essentially halting all new major dams.
- 1987** Parliamentary decree outlaws dam-building on most of Sweden's few remaining undammed rivers.
- 1988** Coho salmon become extinct on the Snake River in the U.S. A coalition of local, national and international groups stops construction of Nam Choan Dam in Thailand. 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 (NBA).

cient technologies and management practices for rivers, and 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.

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. Their 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 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 the 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 teargas 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 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 pro-

- 1989** 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," U.S. Bureau of Reclamation pulls out of Three Gorges Dam, for which it was contracted to offer technical support.
- 1994** Daniel Beard, head of U.S. Bureau of Reclamation, proclaims: "The dam-building era in the United States is now over." 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. 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.



China's massive Three Gorges Dam, if completed, will be the largest hydroelectric dam in the world, providing 10 percent of the country's electricity. The project will, among other things, flood 1,300 known archeological sites, threaten numerous fish species, and force the relocation of nearly 2 million people. The project has been plagued by corruption and huge cost overruns. Photograph from International Rivers Network.

ject and the Bank's role in it. In 1993, the Bank canceled its funding for the project.

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. The reservoir rose into houses three times in 1999. The Supreme Court in October 2000 issued its judgment

which allowed construction to move forward.

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 mobilized 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 nonviolent direct action: company

- 1995** World Bank cancels Arun Dam in Nepal, saying the project is too risky and that alternatives exist. 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.
- 1996** European environmentalists defeat plans to channelize and build a series of dams on the Elbe River.
- 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 (WCD) is launched. U.S. Interior Secretary Bruce Babbitt starts his "Sledgehammer tour." 29 dams are removed in the U.S. In India, 25,000 villagers occupy the Maheshwar Dam site. First international "Day of Action Against Dams and for Rivers, Water and Life" results in 50 actions in 24 countries.

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 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.

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."

Decommissioning Dams Around the World Resistance to dams in a number of countries has progressed to the point where tearing dams down is now a reality. Nearly 500 dams were removed in the United States in the 20th century. But the United States is not alone in its efforts to take down dams. The European Rivers Network in France has successfully pushed for the removal of 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.

Patrick McCully, Campaigns Director of the International Rivers Network, is author of *Silenced Rivers: The Ecology and Politics of Large Dams* (London: Zed Books, 1996). This article was first published in *World Rivers Review*, and is reprinted with permission from IRN. For more information see: www.irn.org or call (510) 848-1155.

- 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 is freed from the confines of the 162-year-old Edwards Dam. Thai villagers again occupy Pak Mun dam site to demand compensation for lost fisheries. 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. A U.S. 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 the fourth time, and 4,000 are arrested. Fourteen officials on the Three Gorges project are accused in the Chinese press of embezzling \$600 million from the project's resettlement fund. In a nonbinding vote, 90 percent of Japanese voters on Shikoku island reject a large dam, in the first referendum ever held on a public works scheme. Prime Minister says the project will likely go ahead anyway. Activists promise to fight. The WCD releases its landmark report. *Reprinted from World Rivers Review, February 2000.*