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International Rivers Network

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Volume 12, Number 6 / December 1997

Special Focus: Three Gorges Dam

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World Rivers Review

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Rough Sailing at Three Gorges Dam

by Catherine Caufield

As a brass band from the Navy's engineering institute struck up "Song for the Motherland," the Yangtze River was diverted into a side channel on November 8. A nationally televised ceremony of the closing of the coffer dam marked the start of construction of the main Three Gorges Dam, the biggest and most controversial dam in the world. Project managers say that the river must be diverted now so that a secure building site for the main dam can be completed before the summer floods begin.

But serious technical problems have arisen that cast a shadow over the official pomp. A potential coffer dam failure, unusable navigation facilities and sedimentation problems threaten the project's safety and viability, according to two engineers who were recently hosted at the dam site by Lu Youmei, president of the Three Gorges Project Development Corporation. And last month a former senior party official called for an immediate halt to construction so that engineers can reinforce the banks of the Yangtze, which he says are becoming increasingly unstable and are likely to collapse and block shipping routes.

In addition, according to a newly released report by the engineers who visited the site, the ship lock walls have been crumbling so badly that work on them has been halted while a team of outside engineers tries to solve the problem. Recently, one of China's most respected hydrologists, Huang Wanli, emeritus professor at Qinghua University, also called for construction to be stopped because the dam will increase the risk of disastrous floods for 500,000 people living upstream. And there have been new predictions that many of the more than 1.2 million people who are being displaced by the dam will resist their forcible evictions.

The river is washing away the massive boulders being used to complete the cofferdam, an indication that engineers have miscalculated river flow and sedimentation rates. In a report by the visiting engineers, Sklar-Luers & Associates, the authors state: "The relatively simplistic methods used in the design calculations regarding sediment supply and transport dynamics force us to conclude that sedimentation is likely to compromise the operation of the dam much sooner and more decisively than anticipated (as it already has in the diversion channel)."

Another issue of concern is that the coffer dam has not been designed to withstand earthquakes. The visiting engineers write: "Given the unusually long period (6-8 or more years) during which the coffer dam will be in use, we were also quite surprised to learn from project engineers that no seismic criteria were used in the coffer dam design. Abundant evidence of neo-tectonic activity, such as offset limestone bedding and fold discontinuities, is in plain view along the bedrock river banks in the vicinity of the dam ... It is unreasonable to assume that the seismic hazards in this region are minimal. The coffer dam ... will be highly vulnerable to ground accelerations of even moderate magnitude.

Follow the Money

Uncertainty about the dam's technical, environmental, social, and financial feasibility has caused many traditional dam backers, including the World Bank, the US Export-Import Bank, the Tennessee Valley Authority, Bechtel Corporation, and Hydro Quebec, to give the project a wide berth. Institutional Investor magazine has called the Three Gorges "the chanciest China play there is." And a coalition of nongovernmental organizations, led by International Rivers Network, the Geneva-based Berne Declaration and Friends of the Earth, have mounted a campaign to dissuade foreign investors from financing the dam.

China has tried to sidestep these objections by funneling foreign financing for the project through the State Development Bank of China, a so-called "policy bank" created in 1994 specifically to fund the Three Gorges and other large politically motivated projects. Though deploring its "severe asset quality problems," Moody's Investors Service gave the bank an A3 rating because it believes that China's rulers are so closely identified with it that they would lose face if it defaulted.

In March 1996, the State Development Bank sold more than \$200 million of bonds in Japan. A planned second offering was suspended, however, after Kazuo Sumi, professor of International Law at Niigata National University, charged that the first bond issue violated Japanese security laws by failing to provide clear information on the use and risks of the bonds. In January of this year, six financial firms, including San Francisco's Bank of America, underwrote a \$330 million bond issue in the U.S. and Europe. There is likely to be another issue later this year.

Half of the dam's official estimated cost of \$29 billion (¥240 billion) is to come from surcharges on electricity bills; 12.5 percent is in the form of a loan from the State Development Bank of China; and another ten percent is to come from profits generated by the Three Gorges itself after 2003 when its first set of turbines are slated to begin generating power. The remaining \$8 billion, is to be raised from loans from other state banks and from domestic bond issues and foreign loans and export credits, including the \$1.2 billion it has already received from Germany, France, the UK, Canada, Switzerland, and Sweden after firms in those countries received \$740 million of contracts.

Sapping Government Coffers

The project's demands on China's economy, however, go far beyond the \$29 billion needed for the dam itself. The government will spend another \$7.25 billion over the next ten years to build the transmission grid needed to transmit the dam's hydro-power. This is equivalent to 5 percent of GNP. Outside analysts

contest these figures, saying that the basic cost of the project is likely to be closer to \$75 billion, more than 10 percent of GNP.

In addition, many of the Chinese firms contracted to work on the dam are turning to the stock market to raise the funds they need to buy equipment and materials. The Gezhouba Company, the project's chief contractor, raised \$132 million on the Shenzhen stock exchange earlier this year. Dongfang Electrical Machinery, a state-controlled firm, raised \$45 million on the Hong Kong stock exchange for new facilities for its Three Gorges work. There are also many subsidiary and spin-off schemes, including a \$450 million Three Gorges Theme Park, a joint venture between a mainland firm and a Chinese-born Australian entrepreneur, which will reproduce in Beijing in miniature the scenic wonders due to disappear under the reservoir's waters.

The government says the dam will be self-financing by 2005 and the project's debt will be repaid completely by 2012. Such a rapid pay-back would be unprecedented in the world of big dams, where it is a rare thing for a project simply to meet its cost and time projections. China's largest hydro-dam so far, the Gezhouba, which is just downstream of the Three Gorges, took 19 years to build and cost \$600 million, rather than the projected five years and \$160 million. The same company that built Gezhouba is building the Three Gorges dam.

Critics of the dam say it is a dead weight on the Chinese economy and the government's determination to continue with it will undermine investor confidence in the country. Similar politically motivated megaprojects, such as the Bakun dam in Malaysia, have been important factors in the investor retreat from other Asian countries. "China's policy projects and the policy banks set up to fund them expose an awful lot of what is wrong with China," says Mark Mansley of Delphi International in London. "Their justification is political, not economic."

Despite the talk of China's move to a free market, China's rulers still exercise a great deal of control over the economy. Three Gorges is just one example of political domination of the market, says another analyst at one of the other ratings agencies. "China is going down the same road of excessive property values, bulging external debts, and government interference with the market that has brought down so many of its neighbors. I think there's a false sense of security there. The question is, is China too big to fall?"

Catherine Caufield is a freelance writer from California. She is the author of Masters of Illusion: The World Bank and the Poverty of Nations (Henry Holt, 1997).

"The age-old dream of the Chinese people to develop the resources of the Three Gorges is closer to coming true. This proves once again that socialism is superior in concentrating resources to do big jobs."

- President Jiang Zemin, at Three Gorges Dam ceremony

Three Gorges Facts

Size of Reservoir: 400+ miles long

Size of dam: 600 feet high by 2 kilometers wide

Number of Places to be Inundated: 13 cities, 140 towns, 1352 villages, 650 factories

Number of people to be displaced: +1.5 million (1980s official estimate, is thought to be as high as 1.9 million today)

Number of people living below the dam endangered by potential dam break: 400 million

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- Visit the [Three Gorges Campaign Page](#) for more information.



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World Bank, Undaunted by Thai Economy, Presses Ahead With Nam Theun 2

by Aviva Imhof

The World Bank has taken the next step on the Nam Theun 2 hydropower project in Laos by agreeing to prepare a package of loans and guarantees for the controversial project. The decision, taken by the Staff Operations Committee on October 30, had been put off for more than a month due to the volatility of the Thai economy. Thailand is the intended client for power produced by the dam.

Jean-Michel Severino, Vice-President of the World Bank's East Asia and Pacific Region, announced recently in Vientiane that as a first step the World Bank had approved a grant of US\$995,000 to be used for environmental and social preparations for the Nam Theun 2 project. "Many, many things remain to be done in many areas, but we think that there is now a good chance that the poverty alleviation, environmental protection and macro-economic targets of this major operation for Laos will be met."

The project consortium NTEC told the Bank last June that it wanted a decision by September or it would pull out. NTEC cannot build the US\$1.5 billion dam without guarantees from the Bank to ensure its investment against actions that might be taken by the Lao Government.

According to the World Bank, the project has now entered the "pre-appraisal" stage. But the precise terms of the guarantees and loans have not been finalized, and the Bank has imposed several conditions that project developers must follow in order to receive financial support. These include compliance with the Bank's program to minimize environmental and social damage in the Nakai Plateau.

The 50-meter-high dam on the Theun River would flood 450 square kilometers of the Nakai Plateau, which is the nation's largest biodiversity conservation area. It would also result in the forcible resettlement of some 1,000 families.

Market Unreality

Critics of the dam were left wondering how the World Bank could forge ahead with the project while Southeast Asia was undergoing an unprecedented economic crisis. Grainne Ryder from the Canadian

NGO Probe International said, "The Bank's on-going support for Nam Theun 2 defies market reality and reveals its dogged commitment to financing big dams at any cost. The World Bank sees this uneconomic, environmentally destructive scheme as one big lending opportunity. Citizens of Lao PDR deserve more intelligent financial advice."

The project's Economic Impact Study, released just before the height of the Thai economic crisis, predicted that the dam would generate less than US\$33 million in annual revenue for Laos - down 80 percent from 1991 projections. Even this figure could be optimistic.

The Electricity Generating Authority of Thailand (EGAT) recently announced that power demand projections for the period 1997-2011 have been cut by 11 percent, or 11,398 MW, as a result of the recent Thai economic crisis. The Thai utility will be postponing purchases from a host of domestic and foreign sources, including Laos. According to Thailand's National Energy Policy Office, the 600-MW Nam Theun 2 is not even on EGAT's latest power development plan. As a result, Nam Theun 2 could be left without a buyer for its power or be forced to sell the power at a price too low to repay its huge construction costs.

Looking on the Bright Side

The Vientiane Director of NTEC, David Iverach, has been trying to minimize the impacts of the Thai economy's downturn on the project. He said recently that the economic crisis had "done Nam Theun 2 a favor." According to Iverach, Nam Theun 2 is such a "robust" project that it is likely to come out ahead of other projects in the scramble to negotiate power purchase agreements with EGAT.

But even the World Bank's vice president for the region was forced to admit he is uncertain how the Thai economy and its declining energy needs would affect the project. Severino said that the timing of the Bank's decision depended on negotiation of a power purchase agreement with the Electricity Authority of Thailand and a concession agreement between the government and the dam developers. "As a price agreement hasn't been signed, it's difficult to give a definitive answer," he said. "But there's a good chance this will be an economically viable project. Otherwise, the promoters and government wouldn't have come this far."

If a price agreement is reached, and environmental and social assessments are accepted, the Bank will do a full appraisal of the project, probably in the middle of next year. If the project reaches that stage it is highly likely it will go ahead.

Info Package Now Available

A campaign information package on the Nam Theun 2 project is now available from IRN for \$15. It is a compilation of clippings, correspondence and background materials on the economic, environmental and social aspects of the project. Contact Yvonne at IRN to order a copy (yon@irn.org, 510.848.1155).

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



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Okavango Delta Communities Speak Out Against Pipeline

by Steve Rothert

Wanga Mahoka begins most of his days by leading his nine cattle to one of the Okavango Delta floodplains near his village, Ngarange. Then, leaving his his cattle to graze the lush floodplain fields, he paddles his dugout canoe (called a *mokoro*) down one of the many papyrus-lined channels to a nearby fishing lagoon, where he sets his nets to trap tilapia. While he waits for fish to fill the nets, he cuts thatching grass to patch his roof before the rains come - which he hopes is soon - and gathers roots of the lily plant for part of the evening meal. On a hot day in October, however, his routine was interrupted by an important community meeting, or *kgotla*.

Kgotlas are the primary means for rural Botswana communities to disseminate information and make collective decisions. In Ngareng, a village of 80 thatched-roof houses overlooking the Delta, *kgotlas* are always held under two large shade trees. Mahoka joined the gathering of 100 or so people sitting in the sand, arranged in the shape of the trees' shadows. The meeting began with a prayer and a word from the Chief.

The topic of this *kgotla* - a follow-up to one in August - is the community's response to the proposed Namibian water pipeline project, which would extract water from the Okavango River upstream of the Delta and pump it to Windhoek, the capital of Namibia. Similar meetings have been held in other parts of the Delta in the past few months.

The discussion about the pipeline stirred many in the meeting to angry questions and impassioned speeches. "How can Namibia take our only source of water when they live so near an ocean that they can desalinate to get drinking water?" asked Nyumba Moremi. "Without this water, we will have nothing to drink or bathe with, no fish, no cattle, no wild animals. We will have to move or die." The Okavango Delta, the world's largest freshwater delta, is fed by just one river, the Okavango. The Delta is incongruously set amid the harsh environment of the Kalahari desert, providing a rare oasis for human inhabitants and wildlife.

After half a dozen or more people echoed Moremi's sentiments, the Chief stood and acknowledged that

the Delta formed the backbone of his community, and that everyone was vehemently opposed to the pipeline. He suggested it was time to discuss the communities' response, and began to read the Okavango Delta Communities letter to Namibia, requesting that the government not build the pipeline (see below). The letter also requests the Okavango River Basin Commission (OKACOM) to involve communities in the process of deciding the Delta's future.

The letter is a joint statement by more than 25 communities in and around the Delta, and was signed by more than 2,000 people. The communities composed and endorsed the letter through a series of *kgotlas* facilitated by the Okavango Liaison Group, a regional coalition of NGOs. The letter is intended to initiate a dialogue between Namibia and Okavango communities, and between the communities and the Botswana government about how best to manage the Delta. The letter will be followed up by further work between the communities and OKACOM to develop a protocol for meaningful public participation in OKACOM's Okavango River and Delta management planning process that will guide the future of the Delta.

After the Chief of Ngarange read the letter and the community indicated its approval, Wanga Mahoka and his fellow villagers stood and stepped out from the shade of the trees and crossed the hot sand to a rickety wooden table where they signed their names to the letter. To signify the end of the meeting, the Chief cried out "*Pula!*" ("Rain!"), and the people replied in unison "*Pula!*"

After taking this first step as an activist to protect his Delta life from the activities of a city far away, Wanga Mahoka took his cattle to the floodplain to graze, and then paddled his *mokoro* to the lagoon.

Letter from Okavango Communities

The following is an open letter from Okavango Delta Communities to the Governments of Namibia, Angola and Botswana, and OKACOM.

To whom it may concern:

We, the communities living in and around the Okavango Delta in Botswana, would like to voice our concerns about planned water extractions from the Okavango River. We depend on the Okavango River and Delta for water, fish and other foods, housing material and our livelihood. The river and delta have already dried considerably in the last 20 years, causing hardship to us. We feel we do not have any extra water to spare.

We understand that the Okavango River is shared by three countries, and that each country needs water. However, we are very concerned that extracting water from the Okavango River will hurt our communities, wildlife, fisheries, farming, cattle and tourism. Therefore, we request that no water be extracted from the Okavango River unless there is no alternative.

If there is no other water source available, we urge the governments of Botswana, Namibia

and Angola, and OKACOM, to study the river and delta and determine how much water can be taken out with out hurting the delta and our communities. This should be done before any water extraction project is constructed.

If an extraction must be built, we urge the governments of Botswana, Namibia and Angola to commit to extracting no more water than is determined to be safe for the Okavango Delta and our communities, and to allow monitoring of any extraction project to ensure compliance.

Furthermore, we request that any proponent of a water development scheme consult with our communities to describe the proposed project and its impact on us, and to listen to our concerns before the project is constructed. Finally, we request to be involved in planning and managing the future of the Okavango River and Delta.

Thank your for your consideration,

Signed by more than 3,000 people in Okavango Delta Communities

For more information on Delta communities' campaign, contact the Okavango Liaison Group at PO Box 859, Gaborone, Botswana. Tel: 267.351.854. Fax. 267.314.259.

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Alternatives to Namibian Dam, Water Pipeline Proposed

by Lori Pottinger

A Namibian nongovernmental organization has proposed alternative sources of power and water that could be developed instead of the controversial Epupa hydroelectric scheme and the Okavango water pipeline, an October 7 article in *The Namibian* reports.

In an open letter to the Namibian government, Earthlife Africa's Namibia branch states that a package of alternatives would effectively cut the cost of the existing schemes by around N\$966 million (N\$1 = US \$0.214).

"We believe that the time has come to look at all four projects together: Epupa, Kudu [a large natural gas field now under development], the Okavango [water pipeline], and desalination," the Earthlife letter states. "The many changes since each was begun, however, demand a critical reevaluation of the national water and power issue. In our view, there is a simple, cheaper and environmentally sensible way to integrate both power generation and provision of water which would make both the Epupa and Okavango projects unnecessary."

The Earthlife Namibia proposal points out the many shortcomings of the proposed Epupa and Okavango projects, and proposes instead a package of desalinization and natural gas projects. The group notes that although Epupa dam is supposed to make Namibia self-sufficient in power, it could fall short during periods of extended drought. And the Okavango pipeline, they said, would disrupt the ecology of the Okavango Delta and set a precedent for future increased water abstraction from the river (see opposite page for a story on the pipeline).

Evaporating Benefits

One option being considered for the dam, called the Baynes option, would create the highest dam in Africa (at 203 meters). This option would have a very large reservoir with an average surface area of about 300 million square meters - a size that project proponents hope would "drought proof" it to some extent. But as Earthlife points out, the disadvantages of a large reservoir in one of the hottest and driest regions of Southern Africa far outweigh its advantages.

"Beyond social and environmental disruptions, Epupa would waste a precious water resource for good. Also, being located in a very hot and dry region, roughly 900 million cubic meters of water would be lost by evaporation from the large dam surface. This is 45 times the envisaged abstraction from the Okavango river," Earthlife said. Namibia has one of the highest evaporation rates in the world. It has been estimated that 83 percent of its meager 284mm of annual rainfall is lost to evaporation.

The organization said the Government would need N\$2.67 billion for the Epupa development, N\$1.15 billion for the Okavango pipeline, and N\$322 million to build a water desalination plant in Walvis Bay and at the Khan dam in the Swakop River. This would total N\$4.232 billion.

On the other hand, Earthlife's "integrated" development consisted of a 12-inch gas pipeline from Oranjemund to Walvis Bay for N\$1.15 billion, a 250-MW gas power station plus desalination plant for N\$966 million and a water pipeline between Walvis Bay and Swakopmund, which the organization says should cost N\$1.15 billion. This totals N\$3.266 billion, which could save the country N\$966 million.

The group also reiterated its stance that the planned 750-MW Kudu gas power now being studied would make the Epupa project superfluous, as it would provide abundant and cheaper power with fewer environmental impacts. Kudu is expected to cost N\$2.2 billion to make Namibia self-sufficient in power for up to 50 years. By then, experts believe renewable energy technology will have advanced to a point where it is more commercially attractive.

Himba Reject Study

Earthlife's recommendations were delivered to the Namibian government just after the Epupa feasibility study was handed over to government officials to review. A short time later, the study was presented to the Himba communities who would be affected by the dam. According to *The Namibian* (October 29, 1997), Himba Chief Paulus Tjivara "spurned attempts by Nampower [the national power company promoting the dam] to hand over a five-volume summary of the study" at an October 24 meeting. The full 21-volume report is in English, and neither it nor the summary has been translated into the local language.

The feasibility study looked at three sites for a dam on the Cunene, but it indicates that the more favored site is in the middle of the Himbas' homeland, at Epupa Falls. The reservoir would drown the Himbas' grazing lands, sacred ancestral graves and the spectacular falls itself.

Because the Himbas' semi-nomadic culture would be so severely impacted by the project, chiefs from the communities to lose land have emphatically stated they are against the project. The study's social-impact sections remain incomplete because the Himba have refused to cooperate with the feasibility study team, according to *The Namibian*. The rift was set off at a March public meeting, at which the Deputy Minister of Mines and Energy, Jesaya Nyamu, indicated that the dam would move forward no matter what the study team found. *The Namibian* notes, "Sources have speculated that without the social impact study in place Government will be hard pressed to find international funding to build the dam."

But the study resolutely proclaims the two best options are fundable, despite its lack of information on social impacts and questionable economic assumptions. The study describes a dam at Epupa Falls as "a relatively low risk, economically feasible but environmentally undesirable option." It goes on to say the project should attract funders unless "the identified environmental impacts are not considered to create unacceptable risks by investors."

The second choice, called the Baynes site, has "somewhat weaker economic merits but is still viable," according to the feasibility study. This option would involve a much more complex design, and therefore more risk. The study goes on, "It has the least negative environmental features of the three feasible scenarios identified, but with serious but largely mitigable social ... consequences. The Baynes project can be characterized as a medium risk, economically marginal and environmentally acceptable option ... Financing this project is possible under the assumption that the risks associated with schedule slippage, cost overruns and environmental impacts of the project are acceptable to investors."

High Impacts

Environmental impacts are not quantified, but are likely to be very high. The river supports a wide variety of species in Namibia's arid north, and the study admits that a dam on the Cunene will cause a "widespread loss of key habitats" for critical species, for which there are no known mitigation measures possible. The report notes that downstream impacts will be severe, even if minimum flows are maintained after the dam is built. There is no guarantee that this will happen, given the regularity of droughts in the region (once every four years) and the implications of dry years on power production.

A section in the study that describes possible resettlement costs for affected people states that a "rule-of-thumb resettlement cost is US\$2,000-12,000 per resettler. For a large-scale project, the lower end of the scale should be applicable. This would mean a maximum total estimated cost in the magnitude of \$100 million, assuming around 10,000 persons were to be resettled. Such a figure is, of course, far too high in the current project."

Evidence from past projects around the world show this figure is more likely too low. The World Bank's 1994 report, "Resettlement and Development," found that underestimating the true costs of resettlement for infrastructure projects is a chronic problem. "Cost overruns for resettlement have generally exceeded overall project cost increases considerably. [Bank analysis] of all energy projects [from 1986-93] involving resettlement found overall cost overruns averaged 35 percent for hydroelectric dams and 10 percent for thermal power plants, while resettlement cost overruns averaged 54 percent."

The massive study, which runs in the thousands of pages, is available on the internet (<http://burmeister.com.na>). The feasibility study will be the subject of public feedback meetings in Namibia in late January.

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



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In Memorium: Fulgencio Manoel da Silva

On October 15th, Bullets struck down one of Brazil's most articulate leaders of the Movement of Dam-Affected People (MAB), Fulgencio Manoel da Silva, in the resettlement area of Caraibas, Pernambuco on October 15th. He died the next day, leaving us all greatly saddened. We feel the absence of Fulgencio's great humor, dignity and determination, and we know we have lost a truly creative spirit.

Fulgencio's family was among the 7,000 uprooted from their homes and farms for Itaparica Dam. For ten years, Fulgencio fought to have the crucial irrigation water promised when Itaparica was constructed delivered to the farmers of the region. Families denied the precious water lived for years on handouts of rice, cornmeal, and manioc flour from CHESF, the regional electrical company, a fact which led to the desperation and lawlessness that resulted in Fulgencio's murder, apparently ordered by the drug mafia operating in the resettlement communities. The death threats received by Fulgencio were reported to local authorities, the local police, and the Brazilian government in May, but they took no action.

One of the things which made Fulgencio most special was his creativity, composing topical poetic songs in the repentista style of the northeast of Brazil. Often he wrote meeting reports in verse. The following is from an interview with him, taped at the International Conference of Dam-Affected People, Curitiba, March, 1997.



My name is Fulgencio da Silva. I was affected by Itaparica Dam. I live in the Caraíba resettlement area at Santa Maria da Boa Vista, Pernambuco.

Itaparica Dam is on the São Francisco River, on the border of Pernambuco and Bahia. Construction of the dam halted agricultural production in July, 1987. A part has been restored, with 45 percent of the resettlement projects functioning. But, seven years went by with production totally deactivated. Another question was the moving of the people, their customs and culture, which were all drowned by the dam... Many rivers and waterfalls were destroyed - they ended up underwater. For a long time, people were affected by water pollution problems. This was because of the flooding of large plantations, where barrels of agrottoxics ended up being flooded by the water, without CHESF taking care to clean them up. Those who continued living near the reservoir got sick, principally with skin diseases, and an increase of cases of diarrhea, principally affecting the children.

I don't feel that any dam has yet provided fair compensation for the affected people. There are palliative settlements, some better and some worse. But just compensation will never take place. Because of the destruction of the environment, the destruction of the history of the people and of their lives on lands now underwater, the history of where they were born and lived, there is not enough money in the world to pay for this.

My role has been to organize the workers, to give them a voice, to bring the workers into the movement through a process of consciousness-raising of those living within the affected area. I am also part of the national leadership of MAB (Brazilian Dam-Affected Peoples' Movement) and I participate in a program of interchange. I have visited other areas more than once, in the northern and southern regions of the country, as well as other states in the northeast, helping groups affected by dams in the region who seek our help.

My goal is that the world, not just Brazil, may study ways to produce electricity without flooding lands and rivers, destroying the environment, and affecting people's lives, and destroying the river as well, because the river also dies. We want people around the world to be concerned with this, principally the directors and others who are part of the World Bank who invest a lot of money in the construction of hydroelectric dams.

We support the proposal for an international day of struggle for rivers, water, and life, because we support all life - that of people and animals, and that of the rivers and waters.

What you can do:

The Union Pole (Polo Sindical) of the lower-mid São Francisco River region is hoping to be able to hire a criminal investigator to bring those who ordered Fulgencio's murder, and who continue to threaten leaders of the dam-affected movement in the region, to justice.

Donations in memory of Fulgencio may be made to the Union bank account, in the Bradesco Bank, account number 28.699-0, bank agency 3052-0, Paulo Afonso, Bahia, Brazil.



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A Great Leap Backward: A History of Dams in China

by Shui Fu

The following is from a new book about the Three Gorges Dam, [*The River Dragon Has Come*](#), edited by Chinese journalist Dai Qing. The book's dozen essays describe the many awesome social and economic problems arising from the world's most grandiose dam project. This excerpt describes the political and historical context behind China's dam-building frenzy.

There were virtually no large-scale water projects in China before 1949. But in the ensuing years, and especially in the years during and since the Great Leap Forward (1958-60), the Chinese Communist Party has heavily promoted dam construction as part of a massive national campaign. In less than forty years all of China's major rivers have been dammed. In the mindset of the Chinese people, dam projects became more than just another kind of construction project; the campaigns promoting dam construction equated harnessing rivers with developing the country and mandated absolutely that citizens demonstrate their "positive support" and "political enthusiasm" for the projects. Under the dictatorship of the Party, the goal of "harnessing water" became equated with "harnessing people."

Most people associate the "Great Leap Forward" with national campaigns to increase iron and steel production. But just as important was "engaging the mass movement" for the "large-scale water conservancy campaign." At that time, water conservancy policy "gave primacy to the accumulation of water irrigation and gave only secondary consideration to drainage and flood control" (*yixuweizhu, xuxiejianchou*). There was, however, lively debate on the subject. One school favored relying on local initiatives to build small-scale dam projects which would emphasize the accumulation of water irrigation purposes. The other favored state-sponsored, large-scale projects whose primary function would be flood-control.

The debate lasted for decades and was transformed from an academic dispute over the merits of the different approaches into a political struggle in which the supporters of the first approach won a decisive victory. As a result, "accumulation" was taken to the extreme. Anhui Province built an excessively large "river irrigation network," while people in the north took the policy of accumulating rain water for

irrigation to such extremes that their fields became waterlogged. Thus the "water conservancy campaign" was ultimately reduced to a campaign to build reservoirs and dams, and by 1990, 83,387 of them had been built in China. Three hundred and sixty six of them had a capacity over 100 million cubic meters, 2,499 had a capacity of 10 million to 100 million cubic meters, and more than 80,000 had capacities below 10 million cubic meters.

In the early 1970s during the Cultural Revolution, there was a second, smaller "Leap Forward" of water conservancy projects in which dam projects and other irrigation projects once again began sprouting up all over the country.

The First Wave

The first dam construction boom in the 1950s was a thrilling time. People's communes, the Great Leap Forward, and the manufacture of iron and steel all stimulated the construction of more hydropower projects. Leaders boldly approved projects to accumulate more water for irrigation without knowing whether they were feasible. According to He Xiaoqiu, the former deputy chief engineer of the Hydropower Investigation and Design Institute of the Ministry of Water Resources Electric Power, all a particular leader had to do was to point his finger at a certain place and the decision would be made to build a dam between one mountain and another. The engineers were left to assess whether the project made sense, but few projects were rejected: no one wanted to be accused of being a "rightist" or "an obstruction on the bridge leading to communism." (The 1957 Anti-Rightist Campaign, which preceded the Great Leap Forward, targeted scientists and intellectuals for persecution.)

As a result, reservoirs for irrigation were built *en masse*. "There was water as far as the eye could see," said He Xiaoqui on visiting one of the country's largest reservoirs, which, to his horror, was being operated by a teenage girl who had just graduated from the hydro training program. The government's slogan, "The land will yield as much grain as the people desire" was being taken to heart - projects were being built (and operated) with abandon.

But some were concerned about the emphasis on accumulation and irrigation over all other goals, and especially about its effects on the land. After the 7,000 Cadres Conference in 1962, Zhou Enlai openly expressed his concern about the situation. "I've been told by doctors that if a person goes without eating for a few days, no major harm will result. But if one goes without urinating for even one day, they will be poisoned. It's the same with land. How can we accumulate water and not discharge it?" In 1964, Zhou pushed for a more comprehensive approach. He proposed a management policy for water conservancy projects that was very similar to the existing policy, but with one important exception: he recommended that all aspects of water conservancy projects be integrated and that the projects be governed by a comprehensive approach to management. Senior hydrologists correctly understood Zhou's policy as an attempt to make the previous policy somewhat ambiguous and to focus on the comprehensive management of water conservancy projects, whatever their size. In 1966, Zhou also commented: "I fear that we have made a mistake in harnessing and accumulating water and cutting down so much forest cover to make way for more agricultural cultivation. Some mistakes can be remedied in a day or a year, but mistakes in the fields of water conservancy and forestry cannot be reversed for years."

However, no one, not even Zhou Enlai, was able to block the national dam building "campaign." In 1958, hydro departments in the Ministry of Water Resources and Electric Power established the Office of the Water Conservancy Campaign (Shulli yundong bangonshi) According to Lui Derun, the then-deputy director of this new office: "Our daily work consisted of making phone calls to the provinces inquiring about the number of projects they were building, how many people were involved, and how much earth they had moved. In hindsight, some of the data and figures we gathered were obvious exaggerations, but no one back then had the energy to check them out." From 1949 to 1959, 800 million cubic meters of earth was moved - 580 million cubic meters in 1958 alone.

Costs Versus Benefits

Before 1949, only 23 large- or medium-sized dams existed in all of China. One, the Fushan dam on the Huai River, was used to block passage across the Huai during an attack against the Wei Kingdom in AD 516. The scale and sophistication of the Fushan Dam were unprecedented for the time, but the knowledge gained through its construction was not passed down: like so much else in China, it disappeared with the collapse of the imperial autocracy. The Fushan dam also demonstrated to the world the kind of disasters that large dams can produce. Four months after the dam's completion, the Huai overtopped the Fushan, releasing 10,000 million cubic meters of water, killing 10,000 people downstream.

The 80,000 dams and reservoirs built over the past forty years have played an important role in flood control, electricity generation and irrigation and have provided water for urban areas and industry. These achievements should not be underestimated, but dam construction, especially during and after the Great Leap Forward, also had disastrous consequences.

By 1973, 40 percent (or 4,501) of the 10,000 Chinese reservoirs with capacities between 10,000 and one million cubic meters were found to have been built below project specifications and were unable to control floods effectively. Even more dams had problems relating to the geology of the dam site, and to sedimentation. Most serious, however, were the numerous dam collapses. By 1980, 2,796 dams had collapsed, including two large-scale dams (the Shimantan and Banqiao dams). One hundred and seventeen medium-sized and 2,263 small dams had also collapsed. On average, China witnessed 110 collapses per year, with the worst year being 1973, when 554 dams collapsed. The official death toll resulting from dam failures came to 9,937 (not including the Banqiao and Shimantan collapses, which had a combined estimated death toll of up to 230,000). Some people say that among the more than 2,000 dam collapses, only 181 involved fatalities but this hardly seems accurate.

By 1981, the number of formally recognized dam collapses had risen to 3,200 - roughly 3.7 percent of all dams in China. According to Ma Shoulong, the chief engineer of the Water Resources Bureau of Henan Province, "The crap from that era [the Great Leap Forward] has not yet been cleaned up." In 1958, more than 110 dams were built in Henan; by 1966 half of them had collapsed. Of four key dams on the Yellow River - the Huayuankou, Wei Mountain, Luokou, and Wangwang Village dams - two were dismantled and two were postponed.

According to experts, if the riskiest of these dams were to fail, hundreds of thousands of people could be killed. But current levels of funding are woefully inadequate to repair or reinforce the dams. At least ¥5 billion would be required for the large and medium sized reservoirs alone. Where will the money come from? According to Vice Premier Tian Jiyun, the task must be completed according to schedule or those in charge will be held accountable., The Ministry of Water Resources, however we, just shrugs its shoulders. Everyone knows the task is impossible. It would appear that the "crap" left by the Great and Small Leaps Forward will linger for some time to come.

It is difficult to predict the disasters that these dams might produce should they fail, because most information regarding dam collapses in China is confidential. During a 1991 conference on dam collapses in Vienna, participating countries exchanged information, as is the general practice, on collapses; in their respective countries. Only China indicated that it had no dam collapses to report. Foreign experts attending the conference commented to China's representative, Pan Jiazheng, that it was miraculous for a country as big as China, a country with 80,000` reservoirs, to have had no dam collapses. Either our representative knew nothing about the dam collapses or, owing to Party discipline, he could not say. All in all, he must have been very embarrassed.

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- See the [Three Gorges Campaign Page](#) for more information.
 - Find out more about [The River Dragon Has Come!](#)



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European Commission to Fund Portuguese Dam

by Marie Arnaud

The European Commission agreed in late July to finance the Alqueva dam program in Southern Portugal, despite protest from Portuguese and international environmental groups.

The European Commission said it had taken account of the environmental concerns which have dogged the project over the past year by setting up a series of monitoring committees to watch over the construction of the dam on the Guadiana river, due to start in 2001. But the World Wide Fund for Nature (WWF) and the Liga para a Proteccao da Natureza (LPN), a leading Portuguese NGO, have demonstrated in the past that the project is a potential environmental disaster, and have raised serious doubts about its economic viability.

"Public money must not be wasted on environmentally damaging schemes such as the Alqueva dam," said Tony Long, director of WWF's European Policy Office. "The problem in this case is that the cost-benefit justification for the scheme is not being made available to the critics."

The 152-meter-high Alqueva dam and a series of smaller dams, all situated near the Spanish border, would create a reservoir with the largest surface area in Europe (250 square km). There are already 38 dams on the watershed of the Guadiana river, which flows from Eastern Spain into the Cadix Gulf in the Atlantic Ocean through Portugal. Apart from the main dam, the irrigation scheme includes 680 kilometers of primary channels, 4,400 km of secondary channels and 9 smaller dams and weirs. It is designed to provide irrigation to 110,000 hectares in the arid Alentejo region, and produce electricity. The construction with all irrigation infrastructure would take about 30 years to complete, according to LPN.

The European Commission said one of the conditions for EU funding for the Alqueva dam project was that Portugal reached an agreement with Spain about sharing the Guadiana river's waters. Under an agreement between the two countries, Spain guarantees a regular flow of water along the Guadiana River. However, there are doubts about Madrid's commitment to this as it is also planning a dam on the river, to irrigate the Andalusia region. WWF warned that the reservoir would require a heavy flow from

Spain. "It is questionable whether during a drought Spain would be prepared to send its water to another country," said Martin Hiller of WWF's European Policy Office. "Already Spain has to import water from other regions to feed the river." He said 30 percent of the irrigation needs of the Alentejo region could be fulfilled by improving the existing network, which currently loses 50 percent of its water due to its inefficiency. In general, it is quite uncertain whether the water balance of the region can carry a project of this size. Moreover, WWF points to the fact that the project lacks a clear and viable development perspective for the region.

The Alqueva dam project also threatens to drown two villages and displace 400 people, for which compensation has only been vaguely studied. It also threatens gypsy and fisher communities which make their living out of the river, and could drown an unknown number of archeological sites. Environmentalists warn that the dam is a potential ecological disaster threatening not only to drown potential conservation areas but also threatening the whole balance of the river, notably its estuary (an important resting zone for migratory birds flying to and from Africa) and habitat areas near the Atlantic. As for the vast irrigation plan, it would lead to the salinization of the land, increased use of chemical fertilizers to improve production and the end of traditional dry farming.

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10,000 People Protest Maheshwar Dam on India's Narmada River



"Narmada Ghati ka Ek hi Naara, Nahin Chhodenge Narmada Kinara" (There is only one slogan of the people of the Narmada Valley - We will not leave the Banks of Narmada)

-Protestors' chant at recent rally against Maheshwar Dam

More than 10,000 people demonstrated at the site of the proposed Maheshwar Dam in central India on October 3, 1997. The protestors, who would lose their lands and homes if the dam is built, demanded a complete halt to construction.

The Maheshwar protest was organized by the NBA, which has been successfully fighting dams in the Narmada Valley for nearly a decade. Local people requested the NBA's help when preliminary work for the project began last year. Speakers at the protest rally included NBA leader Medha Patkar as well as people affected by other dams in the valley.

The dam would be built across the Narmada River in the state of Madhya Pradesh. The 400-megawatt project would submerge some 2,500 acres of land and affect around 2,200 families in 61 villages.

While the State policy explicitly states that "land for land" will be the guiding principle, the people whose lands have been acquired so far have not only not been informed of this provision, but were paid only cash compensation at well below market rates.

Shripad Dharmadhikary of the Save the Narmada Movement (NBA) said, "Local people are enraged at the totally callous attitude of project authorities. People have been told that their land will be submerged yet there is no plan for resettlement. Those whose land has already been seized have received totally inadequate - and illegal - levels of compensation.

Maheshwar Dam is a part of the Narmada Valley Development Project, a plan to build 30 major, 135 medium and 3,000 small dams on the Narmada River and its tributaries. The Maheshwar site is upstream of the infamous Sardar Sarovar Dam which was funded by the World Bank until it was forced to withdraw in 1993. Work on raising the half-completed wall of Sardar Sarovar has been suspended since January 1995 by order of the Indian Supreme Court.

A 35-year concession to build and operate Maheshwar Dam, which is expected to cost over US\$436 million, has been given to S. Kumars, an Indian textile and tires company with no prior experience in dam projects. Financing is being sought from both governmental and private sources.

Project officials have told the NBA that they are searching for a foreign partner to invest in the project, so far without success. According to the officials, negotiations have failed with US company Pacific Generation and a Norwegian company. The officials have also stated that Swiss-Swedish engineering giant ABB and German firm Siemens will supply turbines and other equipment for the dam.

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Sardar Sarovar Oustees Demand Lands Returned, Dam Drained

by Shripad Dharmadhikary

On October 27, a month-long sit-in was called off with an announcement that the participants--all oustees who had been forced off their lands by India's infamous Sardar Sarovar Dam--will no longer seek alternate resettlement lands, and instead now demand that project authorities drain the partially built reservoir to allow oustees to reclaim their traditional lands. The sit-in, which included people from six of the dam's resettlement sites, took place at Kevadia Colony, the town built at the site of the Sardar Sarovar Project (SSP).

As the beginning of this new campaign to reclaim their lands, the oustees yesterday fought with the project authorities and forced them to break the locks and open sheds near the site to shelter their cattle. The oustees are also bringing in wood from their original village and are starting to construct houses near the site.

The oustees belong to the very first village to have been affected by SSP - the village where the dam foundation was laid. Also among the oustees were the earliest to have been displaced, in 1980. The fact that the Government has not been able to resettle these people is a stark indicator of the failure of the project's rehabilitation programme.

History of Broken Promises

These oustees were not opposed to the dam in the beginning. The 150 oustees represent some 250 families. Many were evicted in 1980 and some in the 1990s, and thrown onto six resettlement sites near Dediapada in Bharuch district - an area that will not receive irrigation water from the project, and therefore offers poor farming prospects. From the beginning, these people faced the problem of uncultivable lands, inadequate water and amenities, and a hostile host community. Of course at that time the oustees were not with the NBA and were not opposing the project. They made repeated complaints to the authorities but without any response, and held numerous fasts to draw attention to their cause.

In 1996, frustrated by the lack of a response from the government and the impossibility of survival at their sites, many families went back to their original village. Many were prevented by the police from

taking their belongings. Then on 20 Sept. 1997, some families at one of the resettlement villages were attacked by the host villagers. This resulted in the sit-in at the dam site, and the recent demand to free their land from submergence.

However, Gujarat Government is in no mood to respond. There are two reasons: one, changing the lands would be an admission that the rehabilitation of even the first SSP-affected village has not been done, even after 17 years. And secondly, many others will also demand a change in their resettlement land.

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Bakun Dam Postponed but Resettlement Continues

by Patrick McCully

The swirl of rumor, assertion and denial which has long surrounded Malaysia's Bakun Dam continues in spite of Prime Minister Mahathir Mohammed's September announcement of the project's indefinite postponement. The 10,000 people living in the reservoir zone continue to live under total uncertainty as to their future.

In early October, Malaysian energy minister Leo Moggie told reporters that the project might proceed early next year pending negotiations between the Malaysian company in charge of the dam, Ekran Berhad, and a new construction consortium including Siemens of Germany and Alcatel of France. The new group would replace the consortium led by Swedish-Swiss multinational ABB whose contract to build the dam had been terminated by Ekran. Moggie also stated that work on the diversion tunnels at the dam site was continuing.

The day after Moggie's remarks, however, Deputy Prime Minister Anwar Ibrahim publicly contradicted the energy minister by stating that "we will defer what we have decided to defer". Two weeks later Ibrahim included the postponement of Bakun in his annual budget statement.

The situation was further confused on October 22 when the Malaysian press carried a story stating that ABB chief executive Gšran Lindahl accepted that the project would be delayed for one or two years, but claimed that their construction contract with Ekran was still in force.

Meanwhile, the people whose homes and lands would be flooded by Bakun Reservoir continue to suffer total uncertainty over their future. The people were originally told they would have to leave their homes in 1996, then that moving was delayed until July 1997, and then that it would not begin until this December. Despite the delay in project construction, the authorities are still claiming that resettlement is imminent, the latest date given for its start being mid-January 1998.

The most serious impact of the uncertainty over resettlement has been a lack of food in the affected communities, as they have not grown their usual crops believing that they would lose their fields.

Leaders of the widely scattered indigenous communities in the remote area to be flooded are reported to be furious at the inadequate compensation offered for their lands and assets such as fruit trees as well as the fact that they will have to pay for their new houses. Many of the affected people have refused to accept the compensation package offered and have said that they will not leave their lands.

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