# World Rivers Review

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## Green Image, Grim Reality

### *Iceland and Alcoa Move Forward with "Aluminum Dam" in Glacial Wilderness*

by Jon Swan

Iceland – famed for its geysers, glaciers, salmon rivers, and its one international celebrity, pop singer Bjork – has long enjoyed the reputation of being a squeaky-clean, environmentally aware country. This image has been burnished by dozens of articles touting the nation's stated goal of becoming a "hydrogen economy" (with its energy coming from fuel cells) by 2040. It was further enhanced when, on Earth Day 2001, the country's prime minister flew to New York to accept a "Global Green USA" award in acknowledgement of this laudable energy plan.

At the same time that Prime Minister David Oddsson was looking green in New York, at home he was leading an all-out fight against environmentalists who were outraged at his plans to flood a pristine part of the country's greatest wilderness to provide hydropower for a giant aluminum smelter.

On January 10, 2003, Oddsson's governing coalition could proclaim victory in the latest skirmish in the "Battle of the Highlands," as it is sometimes called. It was on that day that Alcoa's board of directors approved plans for the construction of a US$1.1-billion, 322,000-metric ton aluminum smelter in eastern Iceland. In doing so, the American giant gave its consent to a Soviet-style restructuring of one of Iceland's most precious wilderness areas.

Since the decision, protest rallies in the capital have drawn as many as 1,500 people (equivalent to 1.5 million protestors in the US). Activists vow to keep up the fight.

The restructuring involves building miles of roads, boring miles of tunnels, diverting dozens of rivers, and erecting a 630-foot-high dam – Europe's highest. It will be built on the north side of Europe's greatest glacier, Vatnajokull, a vast ice field in the southeast corner of Iceland beneath which lie several active volcanoes. The project will drown 22 square miles of tundra, presently the grazing ground for more than 2,000 reindeer and the nesting ground for the pink-footed goose, and affect up to 60 waterfalls.


Photo: Jóhann Ísberg

*Icelandic citizens protest their government's recent decision to dam glacial rivers for aluminum smelters. Signs say "With aluminum on your brain," "National Park - not Karahnjuka dam" and "No more highland rapes."*

What else will be lost? Iceland's equivalent of America's Grand Canyon. Dimmugljufur, or Dark Canyon, is a deep cleft carved out by the region's most powerful glacial river, the Jokulsa a Bru. Even the National Power Company, the driving force behind the dam project, calls it "Iceland's most dramatic canyon." The part of the canyon between the edge of the glacier and the dam will be submerged; on the far side of the dam, it will become a dry gulch, the impounded water diverted through a 25-mile-long tunnel to the power station that will generate the electricity needed for Alcoa's smelter.

The level of the immense reservoir will fluctuate seasonally, from 170 to 250 feet. In summer, silt from the exposed banks will blow off all over the countryside. Proponents of the dam insist that the reservoir will be a beauty spot, enhancing the landscape; opponents see a mud-rimmed body of dirty glacial meltwater on whose shores nothing will grow. The Karahnjukar Hydropower Project takes its name from two pyramid-shaped peaks, which will be almost completely submerged.

There is also a divergence of opinion regarding the risks of building a huge dam in a region so close to Vatnajokull, whose hidden volcanoes exploded with tremendous force in 1996. The government discounts the risk of a dam-shattering eruption, noting that most of the active volcanism is west of the proposed dam site. Interviewed last summer by *Geotimes*, a publication of the American Geological Institute, Gudmundur E. Sig-

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# COMMENTARY

# African Water a Hot Commodity

Water privatization is a big issue in many African countries. Investors say it brings efficiency. Opponents say it hurts the poor. Whatever one believes, the poor have no say in the matter. In Tanzania, privatizing the Dar es Salaam Water and Sewerage Authority (DAWASA) was one of the conditions given if the country was to receive debt relief through the Heavily Indebted Poor Countries (HIPC) initiative. Recently, the government raised a credit to fund the US$145 million upgrade of DAWASA, needed to sell off the company at a lower price, effectively increasing the national debt it seeks to reduce. There are concerns that the privatization will produce higher water bills or become another corruption trap.

The African Development Bank (ADB) stated last May that it had signed an agreement with Tanzanian Deputy Minister for Finance for a loan of approximately $47 million, in part to finance the "Dar-es-Salaam water supply and sanitation project." The shortfall of $98 million will be borrowed from the World Bank, the European Investment Bank and Agence Française de Développement.

According to ADB, the project consists of improving "in terms of accessibility, quality, reliability and affordability [the water] services to the population." Further, it would "contribute to poverty reduction and improve the economic and social well-being of [Tanzanians] by providing them with better access to clean water, thereby reducing the incidence of water-borne diseases among vulnerable groups."

It sounds promising, but critics disagree that "poverty reduction" is the real aim of this project. They believe it is merely to find a buyer for DAWASA. In view of a recent privatization scandal, many skeptics fear the project will only enrich the Tanzanian president's family.

The scandalous privatization of the Tanzania Electricity Supply Company (Tanesco) shocked Tanzanians. A South African engineering firm, NET Group Solutions, in April 2002 beat several foreign companies to run Tanesco. It later was revealed that NET Group Solutions was a very small firm with inadequate capacity to handle the national electricity grid. Then it became known that the firm's Tanzanian partner was a company owned by the President's brother-in-law. "Most shocking was the fact that directorship of the local firm includes primary schoolchildren," states an *East African* editorial. After the scandal was out, the government rejected a parliamentary demand to reveal the details of Tanesco's management contract. The privatization process now continues secretly.

In the past five years, the International Monetary Fund (IMF) has been insisting on privatizing DAWASA as a condition to include Tanzania in the HIPC initiative. HIPC inclusion provides Tanzania with significant debt service relief, theoretically worth billions of dollars. Unfortunately, conditional structural reforms, including water supply privatization, are a high price to pay.

The IMF's demand is not unique to its Tanzania policy. The fund is promoting water supply privatization all over Africa, often causing protests from civil society and international anti-globalization groups. Although African state-owned water suppliers mostly are ineffective and run-down, they at least have provided many urban poor people with cheap or free water. Protesters claim these international takeovers are excluding the poor from an affordable clean water supply.

Every day 30,000 children in the Third World die of preventable causes. Many of them could be saved if they had access to safe water. The World Bank argues that governments in impoverished countries have to privatize their water supply if they are to get the efficient delivery of water that is needed.

On the face of it, the argument makes sense. The adequate supply of water and other public services is too often frustrated by inadequate funding, inefficient bureaucracy or lack of political will. Promoters of private ownership say it brings investment and cost-effective service.

Experience and common sense say otherwise. Private investors aren't attracted by poor and rural communities. Any improvements that might come with private ownership are in areas that generate profit. Private water, telecommunications and electricity companies tend to focus on efficiency in collecting tariffs, but not on improving service. Costs usually leap up quickly, annoying the wealthier customers but leaving the poor without service at all. In poor Soweto neighborhoods in South Africa, up to 20,000 homes a month are disconnected from electric service for nonpayment.

People in affected communities don't have a voice in how or if they want their services privatized. People in impoverished countries want efficient service. In some, privatization may be the way to go. They need to be allowed to choose if it is appropriate for them.

Wole Akande

*The author is a columnist for YellowTimes.org, where a longer version of this originally appeared. He grew up in Ibadan, Nigeria near the Ogunpa River.*


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**Editor:** Lori Pottinger

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**IRN**

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**Contact Information:**
IRN
1847 Berkeley Way
Berkeley, CA 94703 USA
Tel: (510) 848-1155
Fax: (510) 848-1008
E-mail: irn@irn.org
World Wide Web:
**http://www.irn.org**



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# Bankrupt Math: World Water Establishment Continues to Promote Flawed Solutions to Water Problems

by Patrick McCully

The glaring mismanagement of the world's water is one of the great social and environmental tragedies of the 20th century. Freshwater ecosystems worldwide are being dammed, drained, pumped dry, built over and polluted. More than a billion people lack access to a decent water supply, and twice as many lack access to proper sanitation. US water analyst Peter Gleick estimates that if water and sanitation services do not radically improve, as many as 135 million people will die from water-related disease over the next 20 years.

So what changes are needed to stop this deadly scenario from happening? The world water Establishment is promoting more big infrastructure projects and privatization as the core of their proposed solutions to this crisis. The water Establishment is dominated by engineering, construction and water supply companies and consultants, development banks and dam-building bureaucracies. It is no accident that the "solutions" they propose would ensure the companies lots of business and the agencies inflated budgets.

But the Establishment's approach has failed in the past, is failing now and will continue to fail. Its continued adoption would worsen water problems and hinder the adoption of real solutions that are both available and affordable.

It is time for a radical change in water management at all levels, from the local to the global. We must press for an approach centered on the satisfaction of basic needs, concern for ecosystems, community involvement and public accountability. If we did so, we could drastically reduce deaths from water-related diseases, ensure sufficient water for crops and reverse the degradation of freshwater ecosystems. But we will not do so if we allow corporations and bureaucrats to decide world water policy.

## Do the Math

The Third World Water Forum, to be held in the historical Japanese capital of Kyoto in March, will draw many thousands of government and UN bureaucrats, construction, engineering and water company executives, and NGO lobbyists and activists. Undoubtedly, the water Establishment's usual line of argument will dominate discussions in Kyoto to justify the promotion of private investment in water and the need for more huge dam and diversion projects.

***Just 1% of current water withdrawals would supply the basic needs of all those currently lacking adequate supplies.***

The argument begins with the "gloomy arithmetic of water" as described by the World Commission on Water: demand for water is growing, rivers and wetlands are being destroyed and aquifers are fast being depleted. Meanwhile four billion people will live under conditions of severe water stress by 2025 and nourishing the growing world population will depend on increasing water storage for irrigation.

The World Bank's Water Resources Sector Strategy claims that "the gloomy arithmetic of water is mirrored in the gloomy arithmetic of costs. The 'easy and cheap' options for mobilizing water resources for human needs have mostly been exploited." The Bank cites the frequently used World Water Council estimate that to meet the water needs of developing countries, investments in water infrastructure would need to increase from the current level of about US$75 billion to $180 billion a year.

A picture is thus built up of the world's poor and the environment facing a water-shortage crisis which can only be solved with huge investments in expensive large-scale infrastructure. This assumption is then used to argue that governments cannot afford such high costs and that only the private sector can make up the difference.

## Mismanagement, Not Scarcity

A more careful analysis of the arithmetic of water, however, suggests a very different set of water solutions. In imagining solutions it is first essential to understand the problem – which is much more one of water mismanagement than water scarcity. Absolute water shortages are not the reason why more than a billion people lack access to decent water supplies. Just 1% of current water withdrawals would supply a basic level of 40 liters per capita per day to all those currently lacking adequate supplies – and to the two billion people projected to be added to the world's population by 2025.

Worldwide, more than two-thirds of water withdrawn from rivers, lakes and aquifers is used for irrigation, with an even higher proportion in arid areas such as Central and South Asia and the western US. Irrigation is usually hugely inefficient, with more half of water applied on average not reaching its intended crops. Furthermore,

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## Who is the World Water Forum?

The watercrats are gathering in Kyoto in March, at the Third World Water Forum. The forum is the brainchild of the World Water Council, a Marseille-based organization founded in 1996 which describes itself as "the International Water Policy Think Tank dedicated to strengthening the world water movement for an improved management of the world's water resources." In reality, the WWC is a lobby group heavily weighted with engineering and construction companies and water supply corporations. The group's president is Mahmoud Abu-Zeid, the Minister of Water Resources and Irrigation in Egypt. One of its vice-presidents is a top executive with French water supply multinational Suez-Lyonnaise des Eaux. Other officers include the Secretary General of the International Commission on Large Dams, and the Honorary President of the International Commission on Irrigation and Drainage, a fervent backer of big dam-and-canal schemes. A sample of the WWC's more than 300 members include: Aguas Argentinas S.A.; Central Board of Irrigation and Power, India; Coyne et Bellier, France; Electricité de France; International Hydropower Association; Japan Association for Dams & Weir Equipment Engineering; Japan Civil Engineering Consultants Association; Japan Dam Engineering Center; Japan Engineering Consultant Co.; Hitachi Plant Engineering & Construction Co.; Mitsubishi Heavy Industries; PriceWaterhouseCoopers; Sardar Sarovar Narmada Nigam, India; Severn Trent Plc, UK; Southeastern Anatolia Project (GAP), Turkey; SNC-Lavalin International Inc., Canada; US Army Corps of Engineers and the World Bank.

**Bankrupt Math** continued from page 3

wrongheaded agricultural policies mean that water-intensive crops like alfalfa, sugar cane and cotton are often grown with subsidized irrigation water rather than being grown where rainfall is plentiful.

According to water expert Sandra Postel, by reducing irrigation by 10%, we could double the amount of water available for domestic supply worldwide. Some obvious solutions include taking the poorest lands out of production; switching to less-thirsty crops; converting to water-conserving irrigation systems; implementing proper agricultural land drainage and soil-management practices, and reducing fertilizer and pesticide use. Switching to water-conserving irrigation systems has the biggest potential – drip irrigation systems could potentially save more than 40% of water now used in agriculture.

In addition, more equitable distribution of food may be necessary to satisfy the global population's nutritional needs as water constraints on agriculture increase. For the past 30 years, around 40% of the world's grain supply has gone to feed livestock. This grain, and the water used to raise it, could be used more productively to feed people.

The approach with by far the greatest potential to solve rural water problems, while increasing incomes and nutritional levels and reducing inequality, is rainwater harvesting. This involves building small dams and embankments and other low-cost structures to trap rainwater and recharge groundwater. Evidence from desert areas like western Rajasthan in India suggests that all but the most drought-stricken regions of the world should be able to meet basic needs for water and food with local supplies if rainwater is captured and used judiciously. Rainwater harvesting programs can be implemented and managed by local communities with little or no outside help. But this benefit of rainwater harvesting is also its downfall in the eyes of the water Establishment – it is of little financial or political benefit to the corporations and government agencies that dominate global water policymaking.

Urban areas are also prodigious wasters of water, with up to 40% of water supplied being lost to leaks or theft in many parts of the world. Too little attention has been paid to demand-side management efforts, which could substantially reduce urban water use. The water which does reach households could stretch much further if middle class households were encouraged to use water-efficient toilets, showerheads, washing machines and other appliances. A water conservation program in Mexico City, for example, which involved replacing 350,000 old toilets with more efficient models, has saved enough water to supply an additional quarter of a million residents. Alternative supply methods such as recycling wastewater and urban rainwater harvesting (such as capturing rain falling on roofs and parks) can add significantly to urban supplies without the need for costly new dam-and-pipeline projects.

## World Commission on Dams on Water Management

The WCD analyzed the worldwide record of large dams, and found major problems with water supply dams. It found that 70% of water-supply dams did not meet their targets, and half of large scale irrigation projects underperformed. It noted that 20% of the earth's land irrigated by big dams is lost to salinisation and waterlogging, and that 5% of the world's freshwater evaporates from reservoirs.

The WCD report included numerous suggestions for alternatives to dams for water supply, including the following:

- "In the irrigation and agriculture sector, preference is for improving the performance and productivity of existing irrigation systems; and alternative supply-side measures that involve rain fed, as well as local, small-scale, and traditional water management and harvesting systems, including groundwater recharge methods."
- "In the water supply sector, meeting the needs of those currently not served in both urban and rural areas through a range of efficient supply options is the priority. Further efforts to revitalize existing sources, introduce appropriate pricing strategies, encourage fair and sustainable water marketing and transfers, recycling and reuse, and local strategies such as rainwater harvesting also have great potential."

### Privatization: A Lose-Lose Situation

Despite years of promotion by the World Bank and other international development agencies, private investment in urban water supply is shrinking. Water privatization is failing both because it has not worked for urban consumers – and it has not worked for the water companies themselves.

The international water cartel is waking up to the difficulties of making profits supplying water even in the better-off cities of the developing world. Water companies who had jumped into "emerging markets" with glee in the 1990s are now licking their wounds, having lost millions in ill-considered investments.

Early this year, French water giant Suez announced it would reduce its exposure to emerging markets by more than a third by 2005 (and took a $500 million charge for writing off its entire investment in Argentina). Heavily indebted German utility conglomerate RWE also announced in January that it would cease making new acquisitions for at least two years. Even the World Bank's draft Water Resources Sector Strategy admits that "under current conditions the private sector will play only a marginal role" in financing water infrastructure. In dogmatically pressuring water utilities to open themselves up for private investment when no private funds are available (or are only available under highly subsidized terms) the water Establishment is only wasting the time and money of water managers and is delaying the implementation of real solutions.

It is now past time for the World Bank and the other pushers of water privatization to step back and rethink. Water must remain a public good. Public sector water utilities have often been poorly run and unaccountable and have often failed to meet the needs of the poor or consider the needs of ecosystems. These utilities need to be restructured and made accountable – and evidence shows that this can be done. There are many well-run and accountable public providers. Through capacity-building arrangements known as "public-public partnerships," functional public utilities can provide managerial assistance to poorly performing utilities.

Water privatization is in any case irrelevant to the great majority of those who lack access to water. More than four-fifths of those without decent access to safe water live in rural areas. Water multinationals have little or no interest in rural drinking water systems as they are rarely able to profit from poor and dispersed rural populations who mainly depend on local water sources such as wells, springs and streams. Similarly, rural populations in developing countries could not even begin to pay the huge costs of water from centralized water systems dependent on large reservoirs, pipelines, aqueducts and pumping stations. The only practical and affordable way of ensuring decent water access for the world's rural dwellers is through small-scale, decentralized schemes based on local water sources.

The UN-affiliated Water Supply and Sanitation Collaborative Council (WSSCC) esti-

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mates that if decentralized, small-scale and technologically appropriate solutions were favored, all the world's people could be provided with adequate water supply and sanitation at a cost of $9 billion a year between now and 2025. While $9 billion is certainly a considerable sum, it is less than a third of current spending on water and sanitation infrastructure in developing countries (and is equivalent to only nine days of US government spending on "defense").

### Low Cost, High Reward Solutions

A stark example of the huge cost differences between the top-down Establishment approaches to water management and community-led approaches comes from Alwar district in the Indian state of Rajasthan. Since 1986, a Rajasthani NGO known as Tarun Bharat Sangh (TBS) has helped villagers build or restore nearly 10,000 water harvesting structures – mainly earthen embankments or small concrete dams across seasonally flooded gullies. The structures impound water which soaks into the ground, recharging groundwater which is then accessed from wells. TBS calculates that around 700,000 people benefit from improved access to water for household use, farm animals and crops.

TBS has contributed around 70 million rupees ($1.4m) in outside funding to the cost of the water harvesting structures. This works out to a cost of 500 rupees per hectare irrigated and 100 rupees (two US dollars!) per person supplied with drinking water. This is just 1% the cost of water supply from the notorious Sardar Sarovar dam project on the Narmada River. (See *WRR*, Dec. 2002 for an article on TBS' work.)

The construction of large dams and inter-basin diversion schemes is the single major reason for the degradation of aquatic ecosystems worldwide. To pretend that building more dams and diversions will somehow reverse this degradation is absurd.

It is also absurd to pretend that the answer to solving the world's hunger problem will depend on building more big dam-and-canal irrigation schemes. Past experience shows that such capital-intensive technologies can raise yields (at least over the short-term) for larger farmers who can afford them or who happen to own land in the limited areas to receive irrigation water. But poor farmers, and the majority living outside the irrigated lands, end up being starved of investment and become poorer and less food-secure.

As Indian water analyst Himanshu Thakker notes, "Rainwater is the mother of all water resources" – all our freshwater resources at one time fell as rain or snow. Rainfall is democratic in that it falls almost everywhere and is not easily monopolized by the powerful. It would be far more beneficial in terms of poverty alleviation and food security to spread investment over the areas where rain falls, rather than concentrating it on the small percentage of land where water can be expensively diverted or pumped from rivers and lakes.

Hunger happens not because the world is short of food – actually we produce much more than enough – but because hundreds of millions of people are too poor to buy it. India now boasts a huge surplus in food grains, its storehouses now holding a quarter of world food stocks – yet more than half India's children are classified as underweight.

Decentralized groundwater recharge is also vital to reduce the vulnerability of rural areas to the increasingly severe droughts being caused by climate change. (Another benefit of rainwater harvesting and forest regeneration is that they reduce the destructiveness of floods, which are also increasing due to global warming.) Climate change is expected to cause major disruptions to the hydrological cycle, meaning that drastic cuts in global warming pollution are a key component in water security.

Analyze carefully the Establishment's "gloomy arithmetic of water" and one sees that it does not add up. But doing the math, dissecting the problems and assessing solutions can be a heartening exercise: the solutions to world water problems are affordable and can be implemented. The main problem is institutional; solving it will require citizens to persuade their governments to stop listening to, and stop funding, the self-interested construction and privatization lobbies of the global watercrats. ■

# Water Through the Kaleidoscope of the World Summit

by Liane Greeff

The World Summit on Sustainable Development (WSSD) – a massive international meeting held in South Africa in September 2002 which drew leaders from around the world – was widely considered a failure by those working on issues of sustainable development. In fact, because of its failure to make significant progress on most major issues, in some circles it is now referred to as the World Summit of Shameful Deals. However, there was some small progress on water issues.

It is hard to focus on the results from the WSSD when every time you look, the picture changes color, shape and intent. It is hard to determine allies and enemies in a world where everyone is using the same language toward different ends. It is also hard to find the truth of politicians between the overt goals of alleviating poverty and saving the planet, and the covert goals of global governments to retain or gain economic power.

The power of the kaleidoscope, however, is that it changes constantly, and our interpretation can give power to the way ahead. By this I mean that we have the power to alter the way the "beads and bits of glass fall" – what is taken seriously and what is forgotten. It is therefore imperative that we understand and translate the WSSD outcomes, and then monitor and hold our governments accountable to those outcomes that we support.

### What We Didn't Get

Civil society groups were very clear about what they wanted to get out of the WSSD process. These are the key water issues we wanted but did not get:

- Recognition of water as a human right (instead, it is called a "human need");
- Recognition of water as a global commons;
- Exclusion of water and water services as a tradable commodity from the World Trade Organization agreements, including GATS (if it is a commodity, the WTO can order the reduction or elimination of "tariff barriers" on water – e.g., environmental regulations and other local laws)
- Reference to agreements protecting international freshwater bodies;
- Reference to the World Commission on Dams and the negative impacts of large dams;
- The exclusion of privatization as a conditionality of donor funding (this was achieved at the Bonn International Conference on Freshwater in 2001);
- A commitment to public-sector water and sanitation delivery;
- A fundamental shift from the "neoliberal" or profit paradigm, which many believe is responsible for the twin crises of poverty and environmental destruction.

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# River Diversion Scheme Transformed to "Revitalization" Plan for Brazil's São Francisco River

by Glenn Switkes

In recent months, an ambitious plan to divert the waters of the São Francisco – the principal river of Brazil's semi-arid, poverty-stricken northeastern region – to agribusiness projects and urban centers has been reborn into a more palatable-sounding series of proposals now being called a "revitalization" program for the river. However, with the original diversion project still not officially discarded, critics say the new set of proposals appear to have been added on to make the diversion


scheme "greener." The new proposals include other large-scale waterworks, including a plan to import water from the Tocantins River basin via a system of canals. One thing's for certain: social programs in the poor northeast of Brazil will be a major focus for the new government of Inácio "Lula" da Silva, so the São Francisco, or "old Chico" as it is known, is sure to be at the center of these efforts.

The São Francisco has long suffered the adverse effects of a series of large dams, deforestation at its headwaters, and pollution from cities along its course. The river flows for 2,700 km from its source in the Canastra mountains of Minas Gerais to the Atlantic. The São Francisco basin is 640,000 square kilometers – roughly the size of the Colorado or Columbia basins in the US.

Large-scale engineering "fixes" for the São Francisco have been advanced in Brazil for more than a century in an effort to solve chronic problems with drought and resulting hunger in Brazil's poorest region. A new study by Renata Marson de Andrade, a doctoral candidate at the Energy and Resources Group of the University of California at Berkeley examines the São Francisco diversion project, and raises doubts about whether the project is feasible for bringing water to rural communities in the outback. The study also compares plans for the São Francisco to failed diversion projects in other countries, including the US.

Environmental studies for the São Francisco diversion project began in 1996, and have involved private consultants as well as the US Bureau of Reclamation, which studied alternatives for the project. (IRN solicited a copy of BuRec's study using the Freedom of Information Act, but the request was refused on the grounds that releasing it could damage US-Brazil relations.) Principal studies for the project were undertaken by the Brazilian government, VBA Consultants (Brazil) and a consortium of Jaako Pöyry (Finland) and Tahal (Israel). The World Bank financed the initial feasibility studies for the project.

Marson de Andrade found that project studies available to her omitted information on the project's comprehensive impacts, including details on localized impacts of diversions from the São Francisco, and related environmental costs; information on alternative technologies for providing water, including re-use; and ecological impacts of inter-basin water transfers, including invasion of non-native species (algae, micro-organisms, seeds, and fish), and modification of physical and chemical characteristics of water.

The EIA also does not address the actual impacts of similar projects in other countries, including projects which have caused soil salinization and groundwater pollution.

## Water Flows Toward Money

In terms of the project's social benefits, Marson de Andrade points out that the diversion project could result in the phenomenon of "water flowing to the wealthiest," which has plagued irrigation projects throughout the world, since sharing the "water wealth" requires considerable investments in local infrastructure. She also points out that improvements in water management in urban areas could save as much water as the project plans to pump from the São Francisco, and that the project could have the effect of encouraging water mismanagement by creating the illusion of water availability.

In addition, the river's existing hydroelectric production could be seriously compromised by water withdrawals from the basin. Currently, 70% of the average flow of the São Francisco is now being used for hydroelectric generation, through the Sobradinho, Itaparica, and Xingó dams.

For the past two years, the EIA for the São Francisco diversion project has been broadly criticized, and political disputes have prevented the Brazilian government from driving the project forward. In an effort to create a new master plan for the São Francisco basin, a broad-based blueprint for what is being called the "revitalization" of the basin is now being put forth by various government agencies. The plan would create a river basin committee to coordinate planning; a plan for economic-ecological zoning which would use technical studies to set guidelines for appropriate use of land and ecosystems within the basin; controls on soil use to minimize soil erosion; identification of ecologically critical areas; reforestation and recuperation of gallery forests; support to traditional populations of fisherfolk, indigenous populations and others; urban sanitation projects; dredging and port construction, and fish repopulation. This ambitious menu of projects has left doubts about what the priorities will be for revitalization of the basin. Now, with a river basin committee for the São Francisco in place, and the Lula government emphasizing actions to fight poverty and hunger in the northeast, the revitalization plan should be the subject of a heightened debate.

Environmentalists have widely criticized one aspect of the "revitalization plan" for the São Francisco – construction of a canal to pipe in water from the Sono River, a tributary of the Tocantins. The fact that the Tocantins basin is already slated for 50 dams, an industrial waterway, and large-scale agribusiness monoculture has failed to dissuade the project's backers, and the Tocantins–São Francisco diversion project is being actively pushed by regional political interests, aided by construction and consulting firms.

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# Will Brazil's Rivers Get a Break in 2003?

by Glenn Switkes

*A massive dam project in the Brazilian Amazon received a setback recently; a new campaign is lobbying for a dam-free Amazon Basin, and early signs from the Lula government about energy policy and large dams are encouraging.*

Late last year, the chief justice of Brazil's Supreme Court upheld a lower court order which suspended the environmental impact studies for the Belo Monte Dam, proposed for the Xingu River in the Brazilian Amazon. Belo Monte would have an installed generating capacity of 11,000 megawatts, making it the world's third largest hydroelectric dam. The project's total cost (including transmission lines) is expected to exceed US$6 billion.

The Supreme Court agreed with the position of public interest attorneys that the impacts of the dam could cross state lines, therefore requiring the licensing procedure to be under the jurisdiction of the federal environmental protection agency rather than the state's. The judge also found that, because the project could impact the Paquiçamba indigenous reserve, project authorities are required by the constitution to consult with the Indians, and a special act of Congress authorizing the project to proceed is required. The decision nullified the EIA which is being prepared by the private think-tank FADESP. FADESP, which won the EIA contract without competitive bidding, has been accused of fraud in its studies for another controversial project, the Araguaia-Tocantins industrial waterway.

Further actions regarding the project will now be left for the government of Luis Inácio "Lula" de Silva, who assumed the Brazilian presidency in January. The energy policy of the new president's Worker's Party has stated that it favors expansion of Brazil's hydroelectric network, but also mentions the need to adequately assess project impacts on local populations and the environment.

There have already been early hints of how the Lula administration might signal change for the nation's energy sector, and for its rivers and communities who depend on them. In a January 5 interview with the *Estado de Sao Paulo* newspaper, Luis Pinguelli Rosa, the new Lula-appointed president of the state electric company Eletrobras, says the company will concentrate on new focal areas. "Our intention is to bring electricity to all of Brazil's people, using alternative energy sources, and stimulating Brazilian industry to produce efficient and cheap solar collectors that will be able to help remote populations. However, we cannot promise miracles." He said the company intends to invest over $1 billion this year.

While emphasizing expansion of the country's electrical generating capacity and grid, Pinguelli says he plans to have Eletrobras follow the social emphasis of the Lula government. "Large dams create many social and environmental impacts. Therefore, we have to give more attention to the dam-affected communities. We want, for example, the Movement of Dam-Affected People (MAB) to participate in discussions regarding the company's projects. The objective is to take greater care with environmental and social issues."

In concrete terms, Pinguelli hopes to use the resources of Eletrobras to take social actions, such as using dam reservoirs for fish raising, generating jobs and producing food. Transmission corridors, he noted, could also be planted to produce food for low-income populations. "There are a series of projects which are perfectly feasible," he noted.

Meanwhile, in January, a coalition of organizations representing indigenous and riverine populations in the Araguaia and Tocantins basin sent a letter to President Lula and his energy and environmental officials calling for a halt to licensing and concessions for new dams in the basin until cumulative impacts of the 50 planned dams planned are evaluated. Calling themselves the Waters without Dams in the Amazon Basin campaign, the groups also proposed an evaluation of alternatives to the proposed dams; a Congressional investigation into the human rights and environmental violations caused by past dams in the Amazon basin, and measures to correct these; and policies that place greater emphasis on research and development of clean energy sources.

Sadi Baron, of MAB (which is a member of the new coalition), said, "In the short run, we hope the new government is open to a dialogue to re-evaluate the social and environmental damages that dams have caused in Brazil. In the longer term, we hope we will be able to work together toward a new energy model for Brazil." ■

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**São Francisco** continued from page 6

More than 30 civil society organizations in the region have joined together to form the Permanent Forum in Defense of the São Francisco River, in an attempt to guarantee the conservation and revitalization of the river and its basin. They are also promoting civil society participation in the river basin committees now being formed under Brazil's 1997 Water Resources Law, which decentralizes decisions on water appropriation and use. According to Anselmo Souza of the Permanent Forum, "We will oppose any new large-scale project affecting the São Francisco until the environmental functions of the river system are restored."

*For more information on NGO efforts to protect the São Francisco River, contact anselmopsouza@ig.com.br. The new study by Marson de Andrade is available in Portuguese from: www.irn.org/programs/latamerica/saofrancisco.pdf*

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**Kaleidoscope** continued from page 5

## What We Got

Although we failed to achieve a fundamental shift in the water paradigm, there are a number of things that we did get in the final WSSD action plan.

- Recognition of the importance of water as one of the key issues in the WSSD;
- A strong section in the Plan of Implementation focusing specifically on water issues;
- Commitment to reduce by half the people without access to drinking water and sanitation by 2015;
- Diluted versions of civil society texts on public-private partnerships and cost recovery. The WSSD version includes all partnerships and to prevent cost recovery being a barrier to poor people's access to water;
- Strong and well networked international and national civil society water caucuses.

## Next Steps

The kaleidoscope is made of mirrors and reflects many images. So too does the World Summit reflect many views, dead-ends as well as some possibilities. We can choose how best to use this flawed outcome in our struggles for water justice. The WSSD was but one milestone on a long path. The next stop along the way is the third World Water Forum (in Kyoto), and there will be other big meetings at which to press a more just water

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# The Stressful Life of Rive

## An Interview with a South African River-Restorer

South Africa's rivers and streams are under stress. Dams, diversions, pollution, invasive exotic species, land clearing and wetlands drainage are just a few of the problems afflicting the nation's 19 major river systems. The government is struggling to balance human needs with ecological requirements, but with rivers already over-stretched and an estimated increase in water demand of over 50% in the next 30 years, it's an uphill battle. The semi-arid country is one of 25 African nations expected to be classified as water-scarce or water-stressed by 2025. South Africa's water stress is even spreading to its neighbors: dams in Swaziland and Lesotho divert rivers for use in South Africa's bigger economy, but both of these countries are expected to join the water-stressed ranks by 2025 as well. At the front lines are people like Mandy Uys, who is working to restore rivers. Uys grew up near the polluted Braamfontein Spruit – a tributary of the Crocodile River north of Johannesburg. Her background in freshwater ecology and years of experience in river-health monitoring led her to the practice of sustainable river restoration.

*WRR: Generally speaking, what is the state of South Africa's rivers?*

MU: Rivers in this country are in moderate to poor health – although some are better than others. According to the National State of the Environment Report, every major river in South Africa has been regulated for water supply. This is a tough problem, especially since in many catchments the need for water exceeds supply. South Africa has taken various steps to categorize the state of its rivers, which is a good first step. There is a national program on river health funded by the Department of Water Affairs and Forestry (DWAF), which monitors the environmental state of rivers. There is also DWAF's classification system which describes the current state of the nation's rivers. Most of our rivers are impacted to varying degrees, as a result of imposed hydrological changes (damming, inter-basin transfers, etc.), clearing of riparian zones, water pollution, exotic plant invasions, urbanization, and poor catchment management.

*WRR: What are some of the positive things you see on the horizon for the nation's waterways, and some of the negatives?*

MU: There are many positives on the horizon. Perhaps the key one is that the 1998 National Water Act requires that before any river water is allocated by the department for abstraction or use, an "Ecological and Human Reserve" must be determined for that system. The Ecological Reserve is the quantity and quality of water (and its distribution in time) required to maintain and protect the aquatic ecosystem and enable sustainable development of the relevant water resources. The Human Reserve is the quantity and quality of water required to satisfy basic needs of people in the catchment. But of the 50-60 reserves that have been determined for various parts of rivers, none have yet been implemented. Implementation will probably come on the larger systems first. Also, virtually no reserve-related environmental flow monitoring has been set in place. As with all policy, no matter how good it is, it's powerless until it can be enacted.

The negative side of things, in my view, is that we are way behind much of the rest of the world in our river rehabilitation strategy. While wetland rehabilitation has accumulated a decade of experience here and is now receiving considerable attention and funding from both private and government sources, there is as yet no coordinated research and development program for the practice of river rehabilitation in South Africa. The initiatives to improve waterways are generally undertaken on an ad-hoc basis, with no standardization or guidelines to assist planning, implementation or evaluation of success. The majority of the river "rehabilitation" projects undertaken are biased toward engineering requirements rather than ecological outcomes. Public awareness needs to be built, guidelines produced, and legislative frameworks set in place to establish river rehabilitation as a recognized practice in this country.

*WRR: Describe the South African government's plan to rehabilitate the nation's rivers and streams.*

MU: The determination of the reserve for each of the country's major rivers is considered a major step toward re-establishing the health of our rivers, but flow and water quality issues are only part of a rehabilitation effort. To my knowledge, DWAF has no formal plan as yet to rehabilitate the nation's rivers and streams. Although rehabilitation is embedded in the National Water Act, the National Environmental Management Act and other legislation, there is as yet no legislative framework in place to provide for the definition and effective delivery of policy.

The parastatal research and funding agency, Water Research Commission (WRC), has announced its intention to launch a research programme for river rehabilitation in 2004. Although it is too early to speculate, I have always envisaged that the ideal program would be strongly linked to the DWAF reserve determination process, to local authority initiatives, the national River Health Programme, Working for Water (a program to clear alien vegetation, which can suck up much more groundwater than native vegetation), and wetland rehabilitation initiatives, amongst others. But this is work in progress, and there is still much to do!

*WRR: What are some of the most effective solutions for fixing South Africa's greatest problems with its rivers and streams?*

MU: We have many problems, and the effective solutions are not all at our fingertips as yet. From a human health point of view, water quality is a huge problem. It has been reported that at least 650 South Africans die of diarrhea every day. In rural areas, the drinking of contaminated river water has in the past few years resulted in many deaths

# ers in A Dry Land

*Mandy Uys relaxing in Cape Town's hills.*

due to cholera. This is only one of a number of water-borne diseases. Possible solutions in this case include increased funding and input into health care and health education in rural areas; and ongoing efforts to provide clean piped water and adequate sanitation to these areas.

From a river point of view, the considerable damage caused to river catchments by invasive alien vegetation encroachment is being addressed at a major scale by the Working for Water programme, managed by DWAF. This program has been effective in meeting the needs of a vast number of unemployed individuals who have been trained and paid to remove alien vegetation from their local catchments. Over the past five or so years, a large number of catchments have been cleared of invasive vegetation. The aims are alien control, the return of closer-to-natural flow in these catchments, and the reestablishment of indigenous riparian vegetation. A subsidiary of this program, Working for Wetlands, is focussed on wetland delineation, rehabilitation and management. These programs are highly effective solutions to both social and environmental problems, combining resource management and protection with capacity building and poverty alleviation.

The nation's urban rivers are possibly the area in which there is the greatest need for solutions in terms of water quality and physical rehabilitation. At present, storm water and flood-control management are still considered the major urban issues, and these are commonly solved by engineering applications. The bio-engineering approaches – using natural materials to remedy structural or hydrological problems in rivers, rather than resorting to concrete – that are being tried in the US, UK, Australia and elsewhere have not yet been adopted to any significant extent here. Catchment-scale planning, management and rehabilitation guidelines for urban rivers would be one solution which could be applied at a local authority level.

*WRR: Describe the restoration project you are working on for the Ihlanza River.*

MU: The Ihlanza River runs through the suburbs of East London, on the east coast. This little river, in its length of only 6km, has been exposed to every urban impact possible, including a shopping center being built over its channel! It has severe water quality problems and therefore health implications, as the river flows into a famous surfing beach. Having been involved with this system for a few years with a local committee, we already had a vision for the river, but needed the scientific work to be done to determine what was possible in terms of rehabilitation. In November 2002, a team of eight specialists did a week of fieldwork at the river to determine its present condition in terms of geomorphology, water quality and quantity, riparian vegetation, fish and invertebrates, and estuarine aspects. We will define likely pre-impact (natural) condition, a present condition, and a future attainable condition for each of the parameters. A series of objectives will provide the detail as to what is required in order to address the current problems.

*WRR: In your work to restore this river, you have said: "The best gift we could give this city would be the skills to bring their rivers back to life." What kinds of skills do you envision citizens learning that will enable them to become actively involved in river restoration? How important is citizen involvement in maintaining the health of rivers?*

MU: I'd say it is largely a matter of citizens becoming aware. Firstly the public needs to be equipped with some basics: that the river is a system which functions at the scale of the catchment rather than just the channel, and that rehabilitation takes decades rather than years. Also, how the river works, both at a physical level (flow, water chemistry, geomorphology) and at the biological level (fish, plants, invertebrates). Once there is some understanding of these fundamentals, basic skills would include the ability to identify alien and indigenous vegetation, and the signs that indicate that physical catchment problems exist – for example that channel incision may indicate excessively high urban flows; bank instability may relate to the clearing of the indigenous riparian zone, gullying or cattle trampling; sedimentation in an otherwise bedrock channel can signify upstream erosion; excessive algal growth indicates eutrophication; alien invaders are a sign of disturbance; discoloration may indicate water quality deterioration. They also need to understand their role in these impacts: for example, the effect that leading one's storm water drain into the sewage system can have on sewerage pipe capacity (and why sewage systems can spill into rivers).

Then there are the simple guidelines which inform the public "what now." What the principles of rehabilitation are; what aspects of the degraded system should be looked at first; what questions to ask and

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# Winds of Change Bypassing Africa

## *Wind Power Would Bring Fresh Air to Africa's Energy Mix*

by Ryan Hoover

The remote fishing town of Lüderitz, Namibia would seem to be an ideal site for a wind project. Blessed with strong, steady winds and surrounded by vast expanses of sand dunes and rock, the town is enjoying something of a boom as a result of underwater diamond mining off the coast, and a growing number of tourists who come to enjoy the quaint German architecture and desert scenery. A wind farm could power this growth and reduce the town's dependence on coal-fired South African electricity produced hundreds of kilometers away.

These are reasons why the Namibian utility, Nampower, proposed construction of sub-Saharan Africa's first large-scale wind project here. Sadly, five years after it was first proposed, the 9MW project languishes in the offices of the country's electricity regulatory body, postponed due to questions over its financial viability. The project as planned, which would produce energy priced at about 3.5-4 US cents per kilowatt hour, could not compete with imported South African energy costing half the price (South Africa's electricity is some of the world's cheapest – and dirtiest). The wind project is not totally off the drawing boards, however. According to Nampower spokesperson Nina Viall, "We are presently awaiting a mandate from the Ministry of Mines & Energy to negotiate better financial structures with interested parties."

Photo: Nordex GmbH

*Installing wind turbines in Egypt.*

Conrad Roedern, a volunteer with the environmental group Earthlife Namibia, believes it would make sense to expand the scheme, thereby driving down costs. "The site in Lüderitz can hold up to 20 3MW turbines," he said, "The only acceptable reason for a delay of this project is to approach a much more meaningful size right from the beginning."

***More than 90% of South Africa's electricity is generated from coal, which adds particulate matter in the air, and contributes to acid rain. It is estimated that around 2,000 children die annually as a result of respiratory infections caused by air pollution, the sixth largest killer of children under four in South Africa.***

The Lüderitz wind farm illustrates wind power's potential in Africa and the challenges to harnessing it. Wind's benefits are enormous. It is pollution-free, renewable, and can be efficiently expanded turbine by turbine, bypassing bulky (and risky) investments in large dams and other megaprojects. Its costs are dropping worldwide, and proponents estimate that it will be cheaper than coal-fired generation by 2012 (and in some parts of the world it is now competitive with fossil fuels). Already, stand-alone wind systems are cost-competitive with extending the electricity grid to isolated communities. Moreover, wind energy has the potential to create 10-40 African jobs per installed megawatt, depending on the amount of local manufacture.

Many African nations have sites with wind-speeds suitable for electricity generation. While some land-locked countries have only a few of these sites, others have a number of potential options. The Eritrean coastline, South Africa's Drakensberg escarpment, Ghana's beaches, and Mauritania's desert all demonstrate optimal wind speeds for electricity generation. According to the South Africa Wind Energy Association, that country has 10,000MW of wind energy along its southwest coast alone.

Many northern African countries have already made significant investments in wind energy. The Zafarana wind farm in Egypt generates 63MW virtually 24 hours per day, providing electricity to 500,000 people. The government plans to expand the facility to 240MW in the near future. Tunisia generates 10.5MW at its Sidi Daoud plant, and the Passat winds of Morocco produce 50MW with another 200MW planned.

Sub-Saharan nations, however, have lagged behind their neighbors to the north. Currently, there are no operating wind farms producing more than one megawatt in the region, and only two are under construction, the 10MW Darling facility near Cape Town, South Africa, and a 5MW pilot project constructed by South Africa's energy utility, Eskom, also on the outskirts of Cape Town.

There are a number of reasons for this disparity:

- The abundance of cheap, coal-generated electricity from South Africa. The average cost for a kilowatt-hour of energy in South Africa is US$0.015. By comparison, electricity generated at the Darling wind project will cost $0.05 per kilowatt-hour. At such low costs, wind projects find it difficult to compete.
- The lack of government directives and incentives. Most African nations have set no renewable energy targets, and few have provided real incentives for investing in wind energy projects.
- The scarcity of local manufacturers capable of building and installing the wind turbines. Most wind equipment is imported from European countries like Denmark, which produces over 60% of all wind equipment used worldwide. This reliance on imported equipment lessens the number of jobs created by wind energy development, and also increases the cost

*continued opposite*

**Interview** continued from page 9

who to ask them of; who controls what (authorities and jurisdictions); how to find out what the river looked like historically; who to contact to provide expert advice; the concepts of historic, present and attainable future conditions and who is trained to provide this input; etc. These are the sorts of skills which empower communities to begin their own river rehabilitation projects. Once there is understanding of what is wrong and how difficult it is to fix it, I also think that public lobbying of local authorities and politicians would increase, which would be an enormous help.

*WRR: If cost and politics were no issue, what would river restoration work be able to accomplish, using what tools?*
MU: In urban areas, rehabilitation or restoration would, over time, have an enormous effect both on the landscape and those living in it. Returning aesthetically pleasing, clean, healthy aquatic ecosystems to urban areas, for example, would not only restore balance and energy to the natural ecology, food web and microclimate, but would also afford humans the chance to re-establish a relationship with the complex family of nature. Even if rivers were not restored to their natural state, but something resembling it, the psychological effect of having a once damaged, dangerous river "returned" in good functional order as a safe green corridor to a town or region would be significant.

The Hawaiian word for water is *wai*, which represents abundance and wealth. *Wai* is a life-force, rather than a commodity. Perhaps the effort and cost that it takes us to return rivers to something resembling their natural state will put us non-indigenous cultures in mind that nature is way beyond an amenity, and that water is far greater than a resource. I would like to think that restoration could eventually accomplish that sort of shift in human ideas.

As to the tools – well, obviously one needs appropriate policy, expertise, skilled individuals with experience in the field of river science and management, and an understanding of the principles of river and storm water engineering. But without enthusiasm, friendliness and dogged commitment, even the most skilled professional will fail to achieve long-term results. That is why community projects, informed by specialists, are such a great way to tackle restoration. My own experience is that successful rehabilitation requires an unstoppably positive person driving the project almost full-time.

*WRR: What is your wish for South Africa's rivers for the new year?*
MU: Firstly, closer-to-natural flow regimes! That is, for dammed rivers, implementation of environmental flow releases, where possible, and careful management of abstraction rates and flow reduction activities downstream. Appropriate flows at the right times of the year would bring many kilometres of river and estuaries back to life and balance. For urban streams, closer-to-natural flow regimes would require a decrease in the amount of paved surfaces (i.e., an increase in permeability), a willingness to try progressive storm water management approaches and flood control measures, and the adoption of bio-engineering approaches.

Secondly, increased water demand management and awareness thereof. Vast quantities of water are wasted by industry, wealthy homeowners, farmers – and leaky pipes! A strong media campaign to create awareness of the scarcity and value of our water resources would certainly help, as would implementation of sliding tariffs. There was a case a while back in Hermanus where the need for a water-supply dam was circumvented purely through imposed demand management. This is the sort of case-study which needs to be used to challenge other municipalities to do likewise. ■

**Wind Power** continued from page 10

because of duties and the low value of many African currencies. In Namibia, a Spanish firm, Elecnor, won the tender for construction of the Lüderitz wind farm. As currently planned, not much local labor would be used.

- The lack of wind speed data. Accurate wind mapping is crucial to identifying the most viable sites, and such research is just getting underway in the region.

## Slow Progress

Gradually, African nations are overcoming these barriers. As the wind industry expands, costs for wind power are steadily dropping, leading some experts to estimate that the average wind-generated kilowatt-hour will cost three cents by 2020. Meanwhile, the costs of coal-fired electricity are on the rise. With the threat of global warming, the costs of coal's environmental impacts are beginning to be factored into the equation. These externalities have been estimated to add up to 4 cents per kilowatt-hour, making wind much more competitive. Moreover, as Eskom's existing coal-fired capacity runs out, the costs of constructing additional power plants could more than double.

African governments are also beginning to recognize the value of renewable energy, and are taking steps to "level the playing field" through economic policy and programs. Kenya removed customs duty on photovoltaic components and solar water heaters more than a decade ago. More recently, Tanzania lowered trade barriers to renewable energy investment by exempting the import of renewable energy equipment from excise duty, customs duty, and sales tax. The governments of Ethiopia, Uganda, Kenya and others have enacted policies that stress the importance of renewable energy to rural electrification.

New potential wind power sites are being revealed by ongoing research. European countries keen to export wind systems to Africa have funded extensive wind-mapping projects. Studies are either underway or already complete in many countries – from Lesotho to Tanzania to Mali.

One of the most hopeful signs of wind energy's growth in Africa is the development of an African wind industry. Three different wind turbines in the 300-watt size have been developed in South Africa. They are manufactured exclusively in South Africa and 95% of their components are produced locally.

In Zimbabwe, a local business designs and builds wind turbines that generate electricity on the smallest of that land-locked country's breezes. The systems cost as little as US$5100, ideal for village use. Connected to a battery, power is generated when the wind blows and stored for later use during calm days. The unit is also capable of charging additional batteries, which spread the benefits of electricity to other users while providing an important source of income to the system's owners.

It will take considerable political will to overcome Sub-Saharan Africa's addiction to cheap coal and hydropower, but the long-term benefits of wind energy are undeniable. With some pilot projects underway and other steps being taken around the region, the winds of change are finally beginning to blow. ■


## UPDATES

**FINLAND:** A December 18 ruling by the Finnish Supreme Court put an end to plans for a large dam on the Vuotos River in the eastern part of Lapland. The decision upheld an earlier ruling by a lower court, which had overturned a building permit for clearing the reservoir area. The Supreme Court noted that, in addition to impacts to the river, the reservoir would destroy lakes, wetlands, and other valuable ecosystems, and that these losses could not be mitigated or compensated for.

The dam would have submerged about 250 square kilometers, which has been called a "biodiversity hotspot," while providing minimal power benefits. The project would have stored water for using at other dams in the region, to provide power during peak times of use.

In the Finnish Parliament, Green League parliamentarians celebrated the news with sparkling wine. "It is a historical decision, when the courts take environmental points of view into consideration," said Green MP Kirsi Ojansuu.

The Kemijoki power company wanted the reservoir as an energy reserve for times of peak consumption of electricity. The company began to buy up land in the area in the 1980s, and now it owns more than 93% of the land that was to be flooded.

Helena Tiihonen, a doctor from the area and a key figure in the movement against the dam, said that decades of uncertainty had caused much harm for local communities. "People have lost their property and moved away," she said, adding that the state should now buy the land acquired by the Kemijoki company and guarantee people the right and opportunity to practice sustainable agriculture, forestry, and reindeer herding, as well as tourism on a small scale.

**INDIA:** In mid-January, a hydropower project in the Narmada Valley will be inaugurated with ceremonies and speeches. But unlike other development schemes in the valley – home to the notorious Sardar Sarovar Project (SSP), a multi-dam scheme that set off a years'-long debate about the best course of development for India – this project has been met with enthusiasm by local villagers. The "micro-hydro" project requires no dam or diversion, will displace no one, and in fact was built by the villagers themselves.

For the past six months the people of the village of Bilgaon and activists from the Narmada Bachao Andolan (which has been working to stop the SSP for over a decade) have been volunteering to build Bilgaon's village electrification system. Designed by the People's School of Energy, the micro-hydro project will produce15 kilowatts of electricity, to be distributed through 13.5 km of transmission lines. The project will light all 12 hamlets of this tribal village at night, and during the day will provide electricity to pump water for drinking and small-scale irrigation, powering a mill and other livelihood-creation projects. With membership from every family, the Bilgaon project will ensure equitable and sustainable usage of the electricity.

The SSP will flood 33 tribal villages and tens of thousands of hectares of forest land. Those being resettled for the huge dam will not get electricity as part of their compensation, nor will tribal villages in the area. The installation cost of the Bilgaon project is 40,000 rupees per kilowatt while the SSP will cost a wasteful 56,000 rupees per kilowatt, activists say.

**CHILE:** Nicolasa Quintremán Calpán, a long time indigenous leader of the movement to oppose Ralco Dam on the Bíobio River, has agreed to a land swap with Endesa, owner of the dam, in effect giving up her opposition to the partly built project.

This agreement allows the acquisition by Endesa of 3.8 hectares of Quintremán's lands, most of which will be flooded by the dam's reservoir. In exchange, Quintremán will get 77 hectares in another region and US$290,000. Endesa also said she will get additional benefits like other resettled families.

The Pehuenche woman, who is in her 80s, said she is tired of the fight, and concerned for her son's health. There are six additional families who have opposed the project and have not signed their lands off. The Ralco Dam will flood 3,467 hectares, much of which is the ancestral lands of 100 Pehuenche families.

The Interamerican Human Rights Commission, an organ of the Organization of American States, accepted a petition submitted by the Pehuenche on December 12, 2002 to look into human rights issues relating to the dam construction. In the interim, it ordered the Chilean government to stop dam construction until the Commission adopted a "definite position." Ironically, the same day the Commission accepted the petition was the day that Quintreman ratified the agreement with Endesa.

The six remaining indigenous families who have resisted signing the agreements, including Quintremán's sister and brother, issued a statement saying they understand the pressures felt by Quintremán, but confirmed that they will not give up to Endesa. Dam construction has not been stopped and the petition to the Commission will not be withdrawn.

**IRAQ:** An dam under construction on the Tigris River in Iraq threatens to submerge the remains of the spiritual capital of the ancient Assyrian empire. Much of the city of Ashur, which thrived for more than 1,000 years until the Babylonians razed it in 614 B.C., would be submerged by the Makhoul Dam, US and European archaeologists said. More than 60 outlying historical sites are also threatened.

Ashur was of such importance that it lent its name to the Assyrian civilization itself. "Losing it would be like, I guess you could say, losing the Vatican," said Mark Altaweel, a Baghdad-born doctoral student at the University of Chicago who is using satellite data to study the ruins-rich region surrounding Ashur.

Ashur sits on a bluff about 130 feet above the Tigris between Mosul and Baghdad. Most of the city remains unexplored. The city was the spiritual center and trading hub of one of the world's first great empires that at its peak stretched from Egypt to Iran and northward into Turkey. Estimates of how much of the city would be submerged vary from half to the entire site.

The dam, slated for completion by 2007, is a product of economic sanctions imposed on Iraq after its 1990 invasion of Kuwait, said John Malcolm Russell of the Massachusetts College of Art in Boston. Iraq has been pushing toward greater self-sufficiency in food production, which has led to the development of massive irrigation projects of which the dam is part, said Russell, an expert in ancient Assyria.

The United Nations Educational, Scientific and Cultural Organization is now assisting Iraq in assessing the Makhoul Dam's impact on Ashur and what, if any, measures can be taken to prevent its destruction, said Giovanni Boccardi, chief of the UN organization's Arab states unit. A report detailing its

recommendations has not yet been made public.

Iraq has also submitted a draft nomination to UNESCO to have Ashur named a world heritage site, a list which includes China's Great Wall and the ruins of ancient Pompeii. But a plan to protect and manage the site must be devised before that status can be granted.

## RIVER RESTORATION

**JAPAN:** For the first time an operating dam in Japan has been slated for removal. Citizens have long complained that the nation's rivers are vastly over-dammed, and a decision to remove the Arase Dam on the Kumagawa River is the first crack in the usual cover-it-in-concrete waterway policy. The governor of Kumamoto cited economic reasons for getting rid of the dam, saying the aging dam generates less than 1% of the annual electricity demand in Kumamoto Prefecture. Even so, the dam will continue to produce electricity for another seven years before it is dismantled. Water use rights for Arase Dam will expire in March. Kumamoto Prefecture will ask the Ministry of Land, Infrastructure and Transport for a seven-year extension rather than the standard 30-year extension.

Prefectural officials had once considered leaving the dam in place but could not ignore repeated complaints from nearby residents who argued that the dam had changed the river topography, polluted the river and all but killed off *ayu* (sweetfish) fishing downstream. Citizens also complained that tremors caused by the release of water from the dam created large cracks in their houses. Takayoshi Igarashi, a professor at Hosei University and a public works expert, welcomed the decision to remove the Arase Dam. He predicts that other older dams in Japan will be affected by the decision and eventually be dismantled as well.

**US:** The Ohio Department of Natural Resources has started demolishing dams along the Olentangy, a central Ohio river, hoping to improve water quality. Removal of the Dennison Dam in October 2002 allowed the Olentangy River to flow more freely, eliminating undercurrents that can endanger canoeists, fishermen and swimmers. Removing the dam, which cost $17,000, is also expected to increase the diversity of fish and aquatic life in that stretch of the river. By creating stagnant pools of water and allowing sediment to build up, the 11 remaining low-head dams on the Olentangy are among the top threats to water quality in the river, according to the Ohio Environmental Protection Agency. The state has plans to remove another dam on the Olentangy near Columbus and, if state officials are able to get permission from enough landowners, all five of the remaining dams on the river in Delaware County will be destroyed.

"Removing the dam has to be part of an overall restoration effort," said Erin Miller, coordinator of Friends of the Lower Olentangy River Watershed, a stream-protection group. "This could have a huge impact on the quality of the river and the public's image of the river," Miller said. "Right now people who walk across the bridges call it the 'Old and Stinky,' the 'Old and Nasty' and other bad names. It's anything but that."

## KILLING WATERS

**GHANA:** A river poisoned by a cyanide spill from a gold mine in 2001 has been hit by more toxic waste from the same mining company, reports Environmental News Service. Water from an abandoned underground mine within the mining concession of Goldfields Ghana Ltd. has seeped into the Asuman River, sparking fears of contamination and a worsening health situation for riverine communities.

As a result, the people of Abekoase have stopped fetching water from the river following its suspected contamination and the October 2001 cyanide spillage in the area. At that time, virtually all life forms in the river and its tributaries were killed. Scientists fear the cyanide and heavy metal residue from that spill could remain for decades, posing a health and environmental threat to the people and wildlife in the area.

The managing director of Goldfields Ghana Ltd. confirmed that the water seepage has occurred.

The communities have called for immediate steps to assess the health implications of the incident.

**US:** Federal water diversions were the main cause of a massive fish kill in the Klamath River in September, concludes a new report from the California Department of Fish and Game (DFG). The river, on the California-Oregon border, is controlled by two large upstream dams.

More than 33,000 adult salmon, including federally protected Coho, died before they could spawn because of federal water diversions to upstream farmers. Low flows "restricted fish passage and increased fish density," increased water temperatures and reduced the amount of oxygen in the river – a "perfect storm" of conditions that led to a fast-moving epidemic of disease. Infectious bacteria and parasites swept through the schooled fish, killing almost all and weakening the rest. DFG reports that about 25% of the year's total run of salmon were killed prior to spawning.

"This report confirms that the Bush administration killed more than 33,000 salmon," said Kristen Boyles, an Earthjustice attorney. "And the truth is the tragedy on the lower Klamath River could be repeated unless the plan for federal irrigation is overhauled."

In March 2001, Interior Secretary Gale Norton attended a ceremonial release of water to farmers in the Klamath River basin. The water had been withheld the previous year due to concerns over endangered fish, but under a new 10-year federal management plan, the water would continue to be provided to the farmers despite risks to fish.

The California DFG warns that "there is a substantial risk for future fish kills" if current flow regimes proposed by the federal government are maintained. DFG recommends "an investigation to determine flows necessary to allow unimpaired upstream passage" of adult salmon, and ensuring that water plans for the region take into account fish and wildlife protection.

Earthjustice is challenging the federal irrigation plan blamed for the fish kill on behalf of commercial fishers, conservation groups and Representative Mike Thompson, a California Democrat who represents northern California coastal communities that were harmed by the fish kill.

An earlier report by the federal agency the US Geological Survey report found that returning water to the Klamath River for fishing and recreation could provide a far greater economic benefit in the Klamath Basin than the current practice of diverting it for farmland irrigation (the full report is available at www.earthjustice.org). It estimates that restoring historic water flows to the Klamath River would generate an economic benefit 30 times greater than providing the water to farmers.

The measures required for restoration, which includes removing dams, increasing river flows and purchasing irrigated lands, would cost about $5 billion, the report said, but recreation and fishing activities could create about $36 billion in economic activity.

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valdason, past director of the Nordic Volcanological Institute in Reykjavik, said he regarded "the observed heavy fracturing of the crust at the dam site, combined with ongoing crustal deformation due to fluctuations in glacier loading" as a "serious matter of concern." He went on to say, "There is no doubt that the project leaders are correct in saying that, in view of the information they received, it is very unlikely that natural events will damage the construction. The question remains if the information received was sufficient and correct."

## Cheap Power

Alcoa is drawn to Iceland by the government's offer of dirt-cheap electricity – a typical gambit to draw aluminum smelters to a country. Icelandic households currently pay up to 11.7 cents per kilowatt hour (kWh), including taxes; the aluminum plant will get a subsidized rate, thought to be about 1.5 cents/kWh. The price will rise and fall with the price of aluminum (which is currently quite low, due to a glut on the market). The utility has yet to release the price at which it will sell Alcoa its hydropower.

It's not just cheap power that draws Alcoa to Iceland: Iceland's reliance on geothermal power has given it an exemption from the Kyoto Protocol regarding fossil fuel emissions, which in turn gives Alcoa an incentive to locate its smelter there. According to an article in the trade magazine *Site Selection* (www.siteselection.com), "Alcoa gets an environmental break by virtue of locating in Iceland, one of the world's most pollution-free nations …[The exemption] will allow Alcoa's smelter to operate without having to pay penalties for any carbon dioxide emissions."

Alcoa doesn't mention this grimy incentive when publicly commenting about the Iceland project, instead focusing on jobs creation and its self-diagnosis of its record on environmental issues. "There are unique environmental challenges presented by Iceland's nature," Alain Belda, Alcoa's chairman and CEO, said in a January 10 press release, "and we promise to exercise best discretion in our interaction with it. We expect that our unrivalled experience, along with new technologies that we have developed will be well utilized to ensure that the project has minimal impact on the environment and the ecosystems supporting it."

Such assurances may comfort American stockholders and export credit banks, but to Iceland's conservationists they seem disingenuous. The construction of the smelter, some 50 miles from the dam site, will not ruin the highlands wilderness; it's the dam, the reservoir, the roads – the entire industrial invasion, led by the National Power Company, of a uniquely pristine place.

The government's position is that the dam and smelter project will alleviate unemployment in the East Fjords. In August 2001, when I interviewed Prime Minister Oddsson in Reykjavik, unemployment nationwide stood at 2.1%, but the figure was deceptive. As Oddsson pointed out, with justifiable pride, Iceland was importing workers. There were, he said, about 1,600 Polish workers in the country's workforce of 160,000. In the East Fjords, where Alcoa wishes to build its smelter, unemployment hovered around 2% in 2001. But, again, this figure fails to reflect the fact that many of the workers employed in the fish-processing plants, which have long formed the basis of the region's economy, come from as far away as Vietnam and China. By December 2002, unemployment nationwide had edged up to 3%.

The government also maintains that the aluminum plant will keep young people down on the fjord, instead of running off to the bright lights of Reykjavik. Skeptics of this rationale say the thought of spending

*continued opposite*

## Aluminum Industry's Addiction to "Cheap Power" Causes Withdrawals for Aluminum-Dependent Economies

by Lori Pottinger

The aluminum industry relies heavily on hydropower – about half of the electricity it consumes worldwide comes from hydro – and it continues to press for more dams the world over. This energy-intensive industry is not only behind numerous past and future destructive large dam projects such as the one in Iceland, but it has used its weight to garner highly favorable electricity contracts from these projects, often paying less for the power than it costs to produce. It has resisted attempts to reduce these subsidies. But subsidized power cannot last forever, and when it goes, sometimes, so does the aluminum industry.

In the US Pacific Northwest, aluminum smelters that were established during World War II (after the federal government offered it cheap hydropower in return for a commitment to manufacture arms) are now considering shutting down partly or wholly. Urban power demands have soared in the region and drought has cut production, so the aluminum industry is fleeing for "cheaper pastures," leaving its workers – and local economies – in the lurch, not to mention fisheries and ecosystems badly damaged from heavily dammed rivers.

Not only have Northwest economies been ruffled by the aluminum industry, but nearby California has been taken for a ride as well. The smelters have in recent years taken advantage of legislation allowing them to sell their "excess power" on the grid at market prices. The logic of giving the companies preferential rates was to provide good-paying jobs in the predominately rural Northwest, but there was no requirement that they actually use the power to keep plants open. So the companies idled plants, sent thousands of workers home, and sold their subsidized power to California during the heady days of the electricity crisis. The aluminum companies resold power that they bought from federal dams for about $25 per megawatt hour for as much as $1,000 per megawatt hour. It is estimated that the region's aluminum companies made a total $1.7 billion by reselling subsidized power.

Half a world away, drought is also cutting into the electricity supply promised decades ago to Kaiser Aluminum in Ghana, and Kaiser is angry about the cuts. The government has had to reduce the power allocation for Kaiser's Valco aluminum smelter. The state energy utility, the Volta River Authority, has said that drought in the West African nation had significantly reduced the operating level of the Akosombo Dam. Kaiser said in a Dec. 31 statement that it "intends to seek relief and the recovery of monetary damages" because of the power reductions. The firm has reportedly sent 600 workers home.

Ghana relies almost entirely on this one hydropower dam for most of its electricity. Drought has crippled Akosombo numerous times since its completion in 1965. The project, which flooded 4% of the nation's land, was built almost exclusively to power Kaiser's smelter, which has benefited for decades from artificially low electricity rates from the dam. Valco is currently paying just 1.1 cents for electricity that costs 6.5 cents to produce, according to government sources.

"The ordinary Ghanaian pays 7.8 cents per kWh. This situation is no longer tenable. Valco has resisted efforts to make it pay a more realistic price reflecting current costs of producing power in Ghana," said a recent government statement.

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one's worklife in the sterile environment of a modern aluminum plant is more likely to appeal to the nation's growing immigrant workforce than to today's young Icelanders. The aluminum plant is expected to create between between 600 and 800 jobs.

## Make it a National Park

Meanwhile, conservationists hold that there is a viable alternative to building an aluminum plant to boost the regional economy: the creation of a vast National Park of Fire and Ice, which would preserve the wilderness north of Vatnajokull. Such a park would, they say, provide both year-round and seasonal jobs for locals, and attract tourists from around the world. Until about two years ago, tourism contributed more to Iceland's economy than heavy industry; since then, with the government going all out to attract aluminum companies, heavy industry has taken the lead.

Meanwhile, another development is worth noting. Until only a few years ago, Iceland was something of a pariah among environmentalists because of its commercial whale-hunting industry. Iceland stopped whaling in 1989 and whale-watching replaced it as means of generating revenue. Only 100 people participated in 1991; 11 years later, the number had grown to more than 60,000. The lesson would seem to be that, if Iceland's government were to put as much money and effort into promoting eco-tourism as it has into wooing foreign aluminum companies, there would be no need to despoil the country's irreplaceable wilderness.

## The WWF Connection

Negotiations between Alcoa and Iceland's National Power Company, in which the government owns a controlling share, began last April. That same month, as if eager to project a green image, the Alcoa Foundation announced a $750,000 grant to the World Wildlife Fund's Russell E. Train Education for Nature Program. According to a WWF press release, the program "operates on the core belief that local communities must be positioned as stewards of their natural resources." To Iceland's embattled environmentalists, the words had a hollow ring.

Ironically, one of the members of Alcoa's board of directors, Kathryn S. Fuller, is also president of the US office of the WWF (she recused herself from all matters related to the dam project, but refuses to comment further on the project). To compound the irony, the WWF's Oslo-based Arctic Programme has for years been the chief source of financial support for the Iceland Nature Conservation Association, the most vocal opponent of the Karahnjukar dam project.

Alcoa may have a cozy relationship with top officials in Iceland's government, but folks at street level have begun to wonder in increasing numbers if what the government is doing is really in their – and the country's – best interests. On October 1, 2002, when Iceland's Parliament reconvened in Reykjavik, hundreds of protestors lined the streets to register their disapproval of the government's eagerness to flood the eastern wilderness. Many of the protesters wore aluminum masks. A few days before, a statue of Iceland's equivalent of George Washington, which stands in front of the Parliament building, was wrapped in aluminum by the step-daughter of Iceland's president.

Another protest action started on October 7: Hildur Runa Hauksdottir, the mother of the world-famous pop artist Bjork, began a hunger strike to protest the damming of rivers and the flooding of the wilderness. She kept the strike up for three weeks.

Throughout November and December, protest meetings were held and demonstrations staged. The movement gained momentum as the deadline approached for Alcoa to make its decision on whether to finalize its contract with the National Power Company. On January 9, Iceland's leading daily, *Morgunbladid*, published a statement from Bjork, which read in part: "We stand at a crossroads. To believe that one has to sacrifice nature in order to become a high-tech modernized nation is outdated thinking.... We have material for one of the most beautiful national parks in the world. A national park – nature conservation – will create hundreds of jobs in East Iceland. A national park will become a symbol for Iceland...."

The day after Alcoa agreed to go forward with the project, it seemed as if the Battle of the Highlands was over. But activists have not given up. On January 14, state television aired a 50-minute documentary on Gudmundur Páll Olafsson, prize-winning author of several books on Iceland's natural wonders, a leading member of the Iceland Nature Conservation Association, and an outspoken critic of the Karahnjukar Dam. Near the end of the documentary, he is shown leading the filmmakers out to the site of Iceland's oldest library, where he proceeds to open a copy of his latest prize-winning book, on the Highlands, and to tear out page after page of photographs he had taken of wetlands and wilderness areas targeted by the National Power Company.

At this point, the conservationists still had reason to hope that the City Council of Reyjkavik, a 45% shareholder in the National Power Company, might refuse to guarantee the loan to construct the Karahnjukar Hydropower Project. The crucial vote was taken on January 14: the tally was 9-5 in favor, with one abstention. One City Council member who voted no said his reason for doing so was that the project would cause "intolerable damage to the nature of Iceland." Mayor Ingibjorg Solrun Gisladottir, who voted with the majority, said she had "gone through all the information relating to this matter and it seems that the power plant will be profitable."

Wilderness, of course, has never shown a profit. It only shows the beauty of a place unspoiled by man. It was the sense that Iceland would no longer be Iceland if it were robbed of the heart of its wilderness that made a crowd of 1,000 or more people gather in front of Reykjavik's City Hall recently and chant, "Don't do it! Don't do it! Don't do it!"

Whether Iceland will "do it" or not will be determined by Parliament in February. There is little doubt as to the outcome of the vote. What remains very much in doubt is whether a country that has acquired a green image will profit by destroying it. ■

*Jon Swan has written on environmental issues for The Amicus Journal, Country Journal, and Smithsonian. In 2001, he trekked into the wilderness region north of Vatnajokull, which, if Iceland's government has its way, will be drowned.*

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agenda. But the water Establishment is not apt to push for serious change. We are the ones who carry the burden of hope, and we are the ones who can press for change. To do this we need to constantly re-evaluate our vision of where we want to be, and to use all opportunities – both inside and outside the mainstream political arena – to achieve this vision piece by piece, here and there, North and South until such time that we live in the world of which we dream. ■

*The author is a member of the International Freshwater Caucus which has been following the international water debate from Bonn throughout the WSSD process. To join the group's email list, contact Shiney Varghese svarghese@iatp.org) or Karin Krchnak (Krchnak@wwf.org).*

Stop Press

# Is Maheshwar Dam Finally Dying?

by Malavika Vartak

Recent developments may well lead to the demise of India's controversial Maheshwar Dam on the Narmada River.

According to the Narmada Bachao Andolan (NBA or Movement to Save the River Narmada), on December 20 local government seized property, including about 327 hectares of land, belonging to the Maheshwar hydropower project. Other property had been seized earlier.

The Maheshwar Dam – India's first private-sector hydroelectric project, with an installed capacity of 400 megawatts – would displace over 60,000 peasants in the Nimad region of Madhya Pradesh. The project has been strongly opposed on grounds of its financial non-viability and flawed resettlement process. The recent development comes as a vindication of the claims made by NBA activists for the past eight years.

The seizure of property was made with regard to a short-term loan taken by S. Kumars, the project developers, from the Madhya Pradesh State Industrial Development Corporation. The loan was taken in 1999–2000 by one of S. Kumars' subsidiary companies for financing the Maheshwar project. According to reports, S.Kumars failed to pay back the money.

The Maheshwar project has been running into huge financial trouble as a result of mass opposition from local people and a successful international information campaign. Over the past four years key international partners have withdrawn from the project. These include Siemens, Bayernwerk and VEW Energie of Germany as well as PacGen, Ogden and Harza Engineering of the United States. In September 2002, S. Kumars tried to persuade the Rural Electrification Corporation (REC), an Indian public finance agency, to invest as a strategic partner. This request was turned down.

Studies done by the NBA show that the Maheshwar project is contrary to public interest and is comparable to Enron's notorious Dabhol project in the neighboring state of Maharashtra. Similar to Dabhol, the Maheshwar Power Purchase Agreement binds the state to pay S. Kumars US$1.25 million for 35 years regardless of whether the project actually produces the projected electricity. This huge burden on an already cash-strapped state will doubtless be translated into dramatic tariff hikes to be borne by consumers.

In spite of massive opposition and fundamental flaws, 10 of India's public finance institutions have already invested around $733,000 into the project. The NBA has now called upon the Reserve Bank of India and the Ministry of Finance to institute an inquiry into the S. Kumars corporate group. It has also called for all public financial institutions to declare their investments in the project as non-performing assets and expedite recovery of public funds.

"Projects with bad economic fundamentals and exhibiting financially irresponsible behavior – such as Maheshwar and Enron's Dahbol plant – are unlikely to ever be viable propositions in the long run," said Silvy Chittaroopa Palit of the NBA. "And all the King's horses and all the King's men can't put them together again. We hope that the government and public financial institutions will now drop this bad dam project and work toward energy projects that are economically, socially and environmentally sustainable."■

SPECIAL FOCUS ON WATER

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1847 Berkeley Way
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