Both ENDS
Information Package
Nr. 4

Dams and the Environment

Both ENDS is an NGO that, among other activities, provides services to NGOs in Africa, Latin America, Asia and Eastern Europe. Both ENDS works on issues relating to the environment, development and social justice. As one of its services, Both ENDS provides access to information that is of interest to NGOs.

Through contact and collaboration with hundreds of organisations worldwide, Both ENDS receives much useful information and documents on specific issues. To provide access to part of this information Both ENDS has decided to compile information packages on some of these issues.

These information packages have been written mainly for Southern NGOs. They contain a brief introduction to the subject and give an insight into the activities, points of view and the ideas prevalent among some NGOs and institutions that have developed specific expertise on the subject. Most of them will be able to provide more specific information. In addition, the information packages include suggestions for further reading and, for those who have access to internet, some addresses of relevant Websites are included.

The packages will be updated from time to time to include newly available information.

As these packages provide a compilation of part of the information available, NGOs can always contact Both ENDS for additional information or contact one of the other organisations mentioned in this document. If you have any suggestions or comments related to this information package, please get in touch with us.

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The information packages can be obtained free of charge by Southern NGOs.

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Dams and the Environment

Introduction

The construction of large dams all over the world, built for different purposes, has a severe impact on eco-systems, (local) economies as well as the social and cultural structures. That is why many organisations and people all over the world, locally, nationally and internationally are fighting against large dams. This is a struggle of local people against the mega-powers in the world, national governments, large funders such as the World Bank and the regional development banks, private investors, enterprises, construction- and electricity companies.

As one of the main campaigning organisations the International Rivers Network puts it: "Massive dams are much more than simply machines to generate electricity and store water. They are concrete, rock and earth expressions of the dominant ideology of the technological age: icons of economic development and scientific progress to match nuclear bombs and motorcars".

Worldwide, 30-60 million people have already been displaced by large dam projects over the last 50 years. Current Dam projects continue to displace millions more.

The world's 40,000 large dams have inundated more than 400,000 square kilometres. The floodplain soils that reservoirs cover provide the world's most fertile farmlands; their marshes and forests the most diverse wildlife habitats. Freshwater resources, because of a host of human assaults, but especially because of dams, are the most degraded of the Earth's major ecosystems. Dams are the main reason why one-fifth of the world's freshwater fish are now either endangered or extinct.

The number of people flooded off their lands by dams is in the tens of millions - 30 million would be a conservative estimate, 60 million more likely. Many people are also killed due to spread of diseases such as malaria due to stagnated water and/or when the dams break.

This package provides general background information on the issue, shows several concrete cases in different parts of the world of the impact of large dams and activities undertaken by both local people as well as international organisations against dams. It also provides a list of organisations that might be able to give additional information on a specific campaign or general information.

Questions and Answers on the International Movement Against Large Dams by Patrick McCully, IRN

Q. What is a large dam? How many large dams are there?
A: A large dam is defined by the dam industry as one higher than 15 metres (taller than a four-story building). There are more than 40,000 large dams worldwide. There are more than 300 major dams which meet one of a number of criteria on height (at least 150 metres), dam and reservoir volume.

Q: Which countries have the highest numbers of large dams?
A: China has around 19,000 large dams. The US is the second most dammed country with some 5,500 large dams, followed by the ex-USSR, Japan and India. Brazil is in tenth place with around 516 large dams. The US has the most major dams - 50 - followed by the ex-USSR, Canada and then Brazil with 16.

Q: How many are being built today?
A: The rate at which large dams are completed has declined from around 1,000 a year from the 1950s to the mid-1970s to around 260 a year during the early 1990s. More than 1,000 large dams were under construction at the beginning of 1994. The countries with the largest

dams under construction are currently China, Turkey, South Korea and Japan.

Q: Why is there so much opposition to large dams?
A: Large dams have provoked opposition for numerous social, environmental, economic and safety reasons. The main reason for opposition worldwide are the huge numbers of people evicted from their lands and homes to make way for reservoirs. The livelihoods of many millions of people also suffer because of the downstream effects of dams: the loss of fisheries, contaminated water, decreased amounts of water, and a reduction in the fertility of farmlands and forests due to the loss of natural fertilisers and irrigation in seasonal floods. Dams also spread waterborne diseases such as malaria, leishmaniasis and schistosomiasis. Opponents also believe that the benefits of dams have frequently been deliberately exaggerated and that the services they provide could be provided by other more efficient and sustainable means.

Q: How many people have been displaced by dams?
A: Between 30 and 60 million, the majority of them in China and India. At present perhaps 2 million people are displaced every year by large dams.

Q: Are people displaced by dams fairly compensated?
A: In nearly every case that has been studied, the majority of people evicted - usually poor farmers and indigenous people - are further impoverished economically and suffer cultural decline, high rates of sickness and death, and great psychological stress. In some cases people receive no or negligible compensation for their losses. Where compensation is given, cash payments are very rarely enough to compensate for the loss of land, homes, jobs and businesses and replacement land for farmers is usually of poorer quality and smaller than the original holdings.

Q: How much land has been flooded under reservoirs?
A: More than 400,000 square kilometres - the area of California - have been inundated by reservoirs worldwide. This represents 0.3 percent of the world's land area, however the significance of the loss is greater than the figure suggests as river valley land provides the world's most fertile farmland, and most diverse forests and wetland ecosystems.

Q: Have many people have been killed in dam collapses?
A: More than 13,500 people have been swept to their deaths by around 200 dams (not including China), which have collapsed or overflowed during the 20th century. Two large dams, which burst when a massive typhoon hit the Chinese province of Henan in August 1975, left an estimated 80,000 to 230,000 dead. This disaster was kept secret by the Chinese government and was only revealed to the outside world in 1995. People have also died in earthquakes caused by the great weight of water in large reservoirs. A magnitude 6.3 earthquake caused by Koyna Dam in India in 1967 killed around 180 people.

Q: What are the benefits provided by large dams?
A: The majority of large dams are built for irrigation; almost all major dams are built for hydropower. Nearly one-fifth of the world's electricity is generated by dams. Dams also provide flood control, supply water to cities, and can assist river navigation. Many dams are multipurpose, providing two or more of the above benefits.

Q: Surely we need dams to produce cheap and clean electricity?
A: Hydroelectricity is cheap to produce - once the dams are built. However, there are huge financial costs involved in building dams and they take a long time to build. The Itaipu Dam (Brazil/ Paraguay), for example, cost $20 billion and took 18 years to build. Actual costs for hydropower dams are also almost always far higher than estimated costs - on average around 30 percent higher. Dam designers are often very optimistic about how much power their dams will produce and often fail to account for the impacts of droughts, meaning that dams often produce less power than promised. Itaipu generates around 20 percent less electricity than predicted.

When these high costs, including delays and risks of low river flows, are added to the costs of electricity it can be seen that hydropower is now an expensive form of power generation. Hydropower cannot be considered as clean power source given its destructive impact on river ecosystems and its many social impacts. Internationally, private investors in power projects are largely avoiding large dams and prefer to invest in cheaper and less risky gas-fired power plants.

Q: What other forms of power generation do critics of large dams support?
A: Electricity use in most parts of the world is extremely wasteful. Before building new power plants, the priority should always be to improve the efficiency of existing energy supply and use. When new power plants are clearly needed, most environmentalists favour the use of solar and wind power, which are now on the verge of becoming commercially viable. Until these renewables are viable, gas-fired generation is cost-effective and has a far lower environmental impact than coal or oil-generation. Small dams can be a sustainable and economic source of electricity, especially in rural areas.

Q: Are dams an effective method of stopping flood damage?
A: Dams can stop regular annual floods but often fail to hold back exceptionally large floods. Because dams lead people to believe that floods are controlled, they lead to increased development of floodplains. When a large flood does come, damages caused are often greater than they would have been without the dam.

Q: Are there other ways of supplying water to farmers and cities?
A: Most water from large dams goes to farmers with only a very small percentage going to cities. Irrigation systems around the world are in general very wasteful of water. The cheapest and most effective way of providing more water to cities is therefore to increase the efficiency of irrigated agriculture. The benefits of irrigated agriculture have in any case been seriously overstated - many large irrigation schemes have displaced huge numbers of small landholders and replaced traditional farming systems with agribusiness plantations producing expensive crops for cities and for export, increasing rural hunger and land displacement. Improving leakage and waste in urban water supply systems is also important.

Q: Do critics of large dams oppose all dams?
In general, critics of large dams do not totally oppose dam construction. However, they do believe that dams (and other development projects) should only be built after all relevant project information has been made public. Independent experts should verify the claims of project promoters, about the economic, environmental and social benefits and costs of projects. The project should only go ahead after the agreement of the affected people.

General information about Dams

Excerpts taken from Silenced Rivers, Chapter 1, IRN.

Dams have two main functions. The first is to store water to compensate for fluctuations in river flow or in demand for water and energy. The second is to raise the level of the water upstream to enable water to be diverted into a canal or to increase 'hydraulic head' -- the difference in height between the surface of a reservoir and the river downstream. The creation of storage and head allow dams to generate electricity (hydropower provides nearly a fifth of the world's electricity); to supply water for agriculture, industries and households; to control flooding; and to assist river navigation by providing regular flows and drowning rapids. Other reasons for building large dams include reservoir fisheries and leisure activities such as boating.

Hydropower generation capacity is a function of the amount of flow and hydraulic head. Although the head is usually related to the height of the dam, a low dam can have a high head if the powerhouse with its turbines and generators is located some distance

downstream of the dam. Pipes known as 'penstocks' direct water to the turbines. Once the water has spun a turbine it flows into the 'tailwater' below the dam through a 'tailrace' pipe.

One advantage of hydro over other forms of electricity generation is that reservoirs can store water during times of low demand and then quickly start generating during the peak hours of electricity use. Thermal power plants take much longer to start up from cold than hydro plants. Hydro's suitability for generating valuable 'peaking' power has in recent years encouraged a boom in what are known as pumped-storage plants. These involve two, normally relatively small, reservoirs, one above the other. During peak hours, the water from the upper reservoir falls through turbines into the lower one, generating electricity. The water is then pumped back uphill again using cheap off-peak electricity.

Weirs and barrages are different types of 'run-of-river' dams, this means that while they raise the water level upstream they create only a small reservoir ('head pond') and cannot effectively regulate downstream flows. A weir is normally a low wall of stone, concrete or wicker. A barrage can be a huge structure ten or twenty metres high extending for hundreds of metres across the bottom reaches of a wide river. The electricity generation of a 'run-of-river' hydropower dam is proportional to the flow of the river at any one time.

While they tend to have less damaging consequences than storage dams, run-of-river dams are far from environmentally benign, and the distinction between a 'run-of-river' and a 'storage' dam is not always clear. Dam proponents have in some cases sought to downplay the impact of planned dams by claiming that they will be run-of-river. Thailand's Pak Mun Dam, for example, is repeatedly described by officials as a run-of-river project yet for much of the time the dam's gates remain closed and it operates as a storage dam. Despite years of reassurances from its builders and funders that it would have minimal impacts on the river, Pak Mun managed within a couple of years to destroy one of the country's richest freshwater fisheries.

Just as every river and watershed is unique, so is every dam site and every dam. There are, however, three main types of dam designs -- embankment, gravity and arch -- selected mainly according to dam-site topography and geology. Earth and rock embankments, which are usually the cheapest to build, make up more than 80 per cent of all large dams. Embankments are generally built across broad valleys near sites where the large amounts of construction material they need can be quarried. Large embankment dams are the most massive structures humanity has ever erected. The most voluminous dam in the world, Tarbela in Pakistan, contains 106 million cubic metres of earth and rock, more than 40 times the volume of the Great Pyramid.

Gravity dams are basically thick, straight walls of concrete built across relatively narrow valleys with firm bedrock. Arch structures, also made from concrete, are limited to narrow canyons with strong rock walls and make up only around four per cent of large dams. An arch dam is like a normal architectural arch pushed onto its back, with its curved top facing upstream and its feet braced against the sides of its canyon. The inherent strength of the shape enables the thin wall of an arch dam to hold back a reservoir with only a fraction of the concrete needed for a gravity dam of similar height.

A dam contains a number of structural features other than the main wall itself. Spillways are used to discharge water when the reservoir threatens to become dangerously high. Dams built across broad plains may include long lengths of ancillary dams and dykes. The five reservoirs of Phase 1 of the La Grande hydropower scheme in northern Quebec, for example, are impounded by eleven dams and more than 200 accompanying dykes stretching for a total length of 124 kilometres.

Impacts of Large Dams

by Lori Pottinger

The Environmental Impacts of Large Dams. Land and water are ecologically linked in a natural system called a watershed. From the smallest droplet to the mightiest river, water works to shape the land, taking with it sediment and dissolved materials that drain to watercourses and, in most cases, eventually to the sea. So, too, is the river a product of the land it inhabits--the type of rock and soil, the shape of the land, and the amount of vegetation are some of the factors that determine the river's shape, size and flow.

When these ties between the land and the river are broken by a large dam, the consequences are felt throughout the watershed, as well as by the web of life it supports. Of all the ways to tamper with or harm a river, a large dam usually has the most immediate and far-reaching effects because of the huge changes it causes to river hydrology--its very circulation system.

Some 40,000 large dams, most of which were built in the past 50 years, now obstruct the world's rivers. More than 400,000 square kilometres--an area larger than Zimbabwe, and 13 times the size of Lesotho--have been inundated by reservoirs worldwide. The world's largest impoundment, the 8,500 square km. Volta Reservoir behind Ghana's Akasombo Dam, flooded 4% of that nation's land area. In the United States, whose 5,500 large dams make it the second most dammed country in the world, they have stopped building large dams, and are now spending great amounts of money trying to fix the problems created by existing dams.

The Environmental Consequences of Big Dams

Although the impacts of large dams have been well documented for some time now, in case after case, new ones are proposed whose environmental impacts are downplayed or even ignored. A 1990 internal survey of World Bank hydroelectric dam projects showed that 58% were planned and built without any consideration of downstream impacts, even when these impacts could be predicted to cause massive coastal erosion, pollution and other problems.

The following are some of the more serious environmental impacts of dams on rivers and the life they support. Here the concentration is on the kinds of impacts that might affect the Orange River watershed, leaving out other major dam-caused problems that have affected rivers under different ecological circumstances.

Effects on River Systems

Reducing the flow of water from a river changes the landscape it flows through, which in turn can affect the ecosystem's flora and fauna. A dam holds back sediments, especially the heavy gravel and cobbles. The river, deprived of its sediment load, seeks to recapture it by eroding the downstream channel and banks, undermining bridges and other riverbank structures. Riverbeds are typically eroded by several meters within a decade of first closing a dam; the damage can extend for tens or even hundreds of kilometres below a dam. Within nine years of closing Hoover Dam in the US, the riverbed below the dam had lowered by more than 4 meters. Riverbed deepening will also lower the groundwater table along a river, threatening vegetation and local wells in the floodplain and requiring crop irrigation in places where there was previously no need. The depletion of riverbed gravel reduces habitat for many fish that spawn in the gravel river bottom, and for invertebrates such as insects, molluscs and crustaceans. Changes in the physical habitat and hydrology of rivers are implicated in 93% of freshwater fauna declines in North America.

Before the Aswan High Dam, the Nile River carried about 124 million tons of sediment to the sea each year, depositing nearly 10 million tons on the floodplain and delta. Today, 98% of that sediment remains behind the dam. The result has been a drop in soil productivity and depth, among other serious changes to Egypt's floodplain agriculture. The Aswan Dam has also led to serious

coastal erosion, another problem stemming from the loss of sediments in a dammed river. Another example of this problem is along the mouth of the Volta River in Ghana. Akosombo Dam has cut off the supply of sediment to the Volta Estuary, affecting also neighbouring Togo and Benin, whose coasts are now being eaten away at a rate of 10-15 meters per year. A project to strengthen the Togo coast has cost US$3.5 million for each kilometre protected. The story is the same on coastline after coastline where dams have stopped a river's sediments.

Hydrological Effects

Dams also change the pattern of the flow of a river, both reducing its overall volume and changing its seasonal variations. The nature of the impacts depends on the design, purpose and operation of the dam, among other things. All parts of a river's ecology can be impacted by changes to its flow. A river's estuary, where fresh water meets the sea, is a particularly rich ecosystem. Some 80% of the world's fish catch comes from these habitats, which depend on the volume and timing of nutrients and fresh water. The alteration of the flows reaching estuaries because of dams and diversions is a major cause of the precipitous decline of sea fisheries in the Gulf of Mexico, the Black and Caspian Seas, California's San Francisco Bay, the Eastern Mediterranean and others. The regulation of the Volta River in Ghana by the Akasombo and Kpong dams has led to the disappearance of the once-thriving clam industry at the river's estuary, as well as the serious decline of barracuda and other sport fish.

Changes to Flooding

The storage of water in dams delays and reduces floods downstream. River and floodplain ecosystems are closely adapted to a river's flooding cycle. The native plants and animals depend on its variations for reproduction, hatching, migration and other important lifecycle stages. Annual floods deposit nutrients on the land, flush out backwater channels, and replenish wetlands. It is generally recognised by biologists that dams are the most destructive of the many abuses causing the rapid disappearance of riverine species. About 20% of the world's recognised 8,000 freshwater species are threatened with extinction.

Dams also affect the floodplain itself. Studies on the floodplain of the Pongolo River in South Africa have shown a reduction in diversity of forest species after it was dammed. And forests along Kenya's Tana River appear to be slowly dying out because of the reduction in high floods due to a series of dams.

Conclusions

Fifty years ago, the United States rushed into a water development program with little understanding of the negative impacts it would have on its rivers and all who depend on them. Today, they are beginning to "pay the piper" in depleted fisheries, damaged ecosystems, receding coastlines and many other problems linked to the damming of their rivers. Now they are being forced to manage their dams differently, allocating more flow to the environment in an effort to stop further dam-related destruction of ecosystems and taking other costly steps to save valuable fisheries. There is even preparation to take down some particularly bad dams, at enormous expense. Big dams are no longer being built.

Although it has now become very difficult to build destructive river projects in the US and many other highly dammed countries, the hydro industry and financial institutions continue to export this obsolete technology, much in the same way the chemical industry continued to export pesticides long after they had been banned in the country of origin. At dam conferences, the talk these days always centres on finding "fresh Markets" to exploit and new ways to sell dams to a sceptical public.

Cases

Argentina/Paraguay: Yacyreta Dam

The Yacyreta Hydroelectric Project (YHP) is a joint project between Argentina and Paraguay that involves the construction of a large dam, 67 km. in length, on the Paraná River. The project has been plagued by delays, corruption, procurement disputes, political changes, and the reluctance of the Argentine government to provide its share of counterpart financing. The World Bank's handling of their loans over a 17-year period display continual violation of their own policies and procedures. The dam as planned will inundate approximately 109,000 hectares in Paraguay and Argentina, including unique river island ecosystems with endemic species. The reservoir has already been partially filled. The World Bank and the Inter-American Development Bank (IDB) have provided more than US 1,740,000,000 for the project since 1979. The Paraguayan NGO Sobrevivencia, filed a claim on its own behalf and representing local people affected by the Yacyreta project, jointly with both the IDB and the World Bank on September 30th, 1996. The organization charged that the project's severe problems were caused by violations of World Bank and Inter-American Development Bank environmental and resettlement policies. The claim led to the development of a new model that can be used to investigate other development projects with social and environmental consequences.

Argentina: Paraná Medio

The Paraná Medio Project in the Paraná River in Argentina would require construction of an 8.5 kilometre frontal dike over Chapeton Island, and a lateral "megawall" 240 km long and 15 meters high between the cities of Santa Fé and Goya. Installed generating capacity would be 3,000 MW. Two north-south toll roads would be built, and the cities of Santa Fé and Paraná' would be joined by a bridge crossing the river. The Paraná Medio reservoir would be the longest in the world. Shipping locks would be built to permit ships to pass the dam.

Paraná Medio would have serious environmental impacts. Flooding hundreds of fluvial islands, the project would create an enormous lake more than 15 meters deep, and four times the area of the reservoir at Yacyretá (Paraguay/Argentina).
The dam would flood 760,000 hectares, much of it productive agricultural land, also inundating important habitat of 250 bird, 200 mammal, and nearly 400 reptile and amphibian species, in addition to interfering with the reproductive cycle of 300 fish species - the dam would produce only 3.57 kw. per hectare flooded.
Project proponents estimate that the project would create 10,000 temporary jobs. However, as many as 30,000 jobs in ranching, rice farming, fishing, tourism, and forestry might be lost as a result of ecological changes resulting from the construction of the dam. Income from 100,000 tourists annually generates $5-10 million. After construction of the 15 meter-high dikes, the river would no longer be visible from coastal towns. Ports along the river would have to be rebuilt or moved. The public treasury would have to pay for health, education, and welfare expenses caused by changes in the social fabric of the region.
Recent studies have linked the spread of previously controlled diseases such as dengue fever, schistosomiasis, and malaria with the construction of dams in the Paraná basin. Coastal cities can be expected to have to construct new sewage systems to dispose of urban wastes.

See also: The Encycloediacase No Way Hidrovia Waterway http://www.bothends.org/encycl/cases/viewcase.php?cat=2&id=1&id_language=1

Chile: Pangue and Ralco Dam, Biobío River

The Biobío River springs from Icalma and Galletue lakes in the Andes, flows through steep and narrow gorges and forests of araucaria pine, passes through agricultural lands and cities, until it reaches the Pacific Ocean, 380 km from its source. Its watershed has a surface area of 24,260 square kilometres and is 380 km long. Over one million people use the resources of the Biobío for drinking

and irrigation water, recreation, and fisheries.

ENDESA, the largest private company in Chile, plans to construct six hydroelectric dams on the Biobío. The first of these, Pangue, was completed in 1996. ENDESA now says it will move ahead with construction of Ralco, the largest of the Biobío dams, in early 1999. Ralco would be a 155 meter-high dam with a 3,400 hectare reservoir, which would displace more than 600 people, including 400 indigenous Pehuenches. The dam would flood over 70 km of the river valley, inundating the richly diverse forest and its wildlife.

The upper Biobío, the site of the proposed dam, is home to Chile's most traditional indigenous people, the Pehuenche. A significant number of indigenous families refuse to leave their traditional homelands in the Upper Biobío. This will likely force a court battle between Chile's Indigenous Law (designed to protect the lands of Chile's indigenous population) and Chile's Electric Law (passed during Pinochet's regime, the law gives carte blanche to any project that provides energy for the country).

Environmental and indigenous rights groups oppose the project not only because of the wide scale destruction and human rights abuses, but also because projections of Chile's future energy requirements indicate that the energy it would produce will not be needed.

India: Sardar Sarovar Project, Narmada

Amongst the 30 large dams planned for the Narmada, the Sardar Sarovar dam is the largest. With a proposed height of 136.5 m (455 feet), it is the focal point of both the dam-builders plans and the Narmada Bachao Andolan's (NBA) opposition. The Govt claims that the multi-purpose Sardar Sarovar Project (SSP) would irrigate more than 1.8 million hectares (mostly in Gujarat, some in Rajasthan) and quench the thirst of the drought prone areas of Kutch and Saurashtra in Gujarat. The opponents of the dam counter that these benefits are grossly exaggerated and would never accrue to the extent suggested by the Govt. Instead the project would displace more than 320,000 people and affect the livelihood of thousands of others. Overall, due to related displacements by the canal system and other allied projects, at least 1 million people are expected to be affected if the project is completed.

With no information forthcoming from the Govt. regarding the details of the project or the plans for the people to be affected etc. the NBA declared its opposition to the entire project taking into consideration the scale of adverse impacts. Throughout 1990-91, with a series of *dharnas* (sit-in's), non-violent protests (*satyagraha*) the NBA highlighted the plight of the ousted people and the fundamentally flawed nature of the project. Under intense pressure, the World Bank (which was funding the dam to the tune of $450 million) was forced to constitute an independent review committee, the Morse Commission. The first independent review of any of the Bank funded projects; the Morse Report indicted the Bank on many counts and tacitly endorsed all the main concerns raised by the Andolan. The resultant international furore forced the Bank to finally withdraw from the project (with mutually face-saving measures for the Banks and the Govt. of India which asked the Bank to leave one day before the deadline for some stipulations was to expire).

Following a writ petition by the NBA calling for a comprehensive review of the project to take into consideration all the concerns raised, the Supreme Court of India halted construction of the dam in 1995 at a height of 80.3m.

However, in an interim order in February 1999, the Supreme Court gave the go ahead for the dam's height to be raised to a height of 88m (85m + 3m of "humps"). Resultant increased flooding in the monsoon season of 1999 could potentially drown the homes and lands of as many as 2000 tribal families in about 50 villages.

Mekong

The Mekong is the world's tenth longest river and is the heart and soul of mainland South-East Asia. It supports one of the world's most diverse fisheries. From its headwaters on the Tibetan Plateau, it runs 4,000 kilometres south through Yunnan Province of China, Burma, Thailand, Cambodia, Lao PDR and Vietnam. More than 50 million people depend upon the Mekong River and its tributaries for food, water, transport, and many other aspects of their daily lives. The river's annual flood-drought cycles are essential for the sustainable production of food crops on the floodplains and along the banks of the rivers during the dry season.

Although dams currently regulate less than five percent of the Mekong basin, over the past ten years more than 100 large dams have been proposed for the region. Some of these dams are already under construction and others are in the advanced stages of planning. These dams will have widespread impacts on the livelihoods of Mekong communities and on the natural ecology of the river system.

Bakun Dam, Malaysia

On 4th September 1997, the Malaysian Prime Minister announced that the 2,400 Megawatt Bakun Dam would be postponed indefinitely. This was one of several major infrastructure projects in Malaysia to be postponed due to the Asian economic crisis. Earlier the same day, the Bakun Hydroelectric Corp., the supposed owner and operator of the dam, terminated its multi-billion dollar engineering and construction contract with an international consortium led by Swiss-Swedish multinational ABB and Brazil's CBPO, due to long-running contractual disputes.

Critics of the dam see the indefinite postponement as a vindication of their long stated opinion that the project was economically not viable, as well as environmentally and socially disastrous. Although the project remains indefinitely deferred, resettlement of the 10,000 indigenous forest dwellers living in the reservoir zone is scheduled for September 1998. The Bakun Region People's Committee, which represents affected people who oppose the project, has appealed to the government to shelve the resettlement exercise due to unresolved issues over the resettlement process, and the indefinite postponement of the dam itself. Press reports indicate that the project may eventually be restarted on a scaled down basis.

Lesotho Highlands Water Project

The Orange River has its headwaters in the high mountains of Lesotho, a tiny landlocked nation completely surrounded by South Africa. The rural mountain communities farm and herd their animals in the rugged mountain watersheds, proud of their ability to survive the harsh conditions. Their mountain watersheds are fast becoming lakes, however, as the massive Lesotho Highlands Water Project moves forward. The estimated US$8 billion project is designed to divert water from the Orange River to the urban and industrial Gauteng region in South Africa through a series of dams and tunnels blasted through the mountains.

The first dam in the multi-dam scheme (called Katse) is complete and the second is moving ahead. Katse Dam's gates closed in late 1995, despite the fact that critical social and environmental problems affecting some 20,000 Basotho people remain unresolved.
The second dam, called Mohale, is now underway, despite the fact that water-conservation experts in South Africa have stated that further dams could be postponed if "demand management" measures are implemented. Projections by the water provider, Rand Water, indicate Mohale Dam could be delayed by a few years with a 10 percent decrease in consumption, or up to 17 years with a 40 percent decrease - decreases they believe are achievable.
Critics fear that moving forward with the dam before the water is needed will stall demand-management projects, and needlessly increase the cost of water at a time when the government is undertaking the costly venture of improving water service to millions of South Africans in the townships.

Epupa Dam, Namibia

The Kunene River is one of just five perennial rivers in arid northern Namibia, and is considered a precious resource by those who live near it. The river has long supported the semi-nomadic Himba people, who are one of Africa's most successful remaining pastoralist peoples. The government of Namibia is currently planning a huge hydroelectric scheme on the Kunene that would devastate the Himba and the river's ecosystem.

The dam's reservoir would evaporate more water each year than the entire urban population of Namibia uses - a major issue in a country that continually suffers from drought and water shortages. If built, the project will flood 250 square miles of land inhabited by the Himba people and affect thousands of people. The reservoir would flood ancestral graveyards as well as critical dry-season grazing lands for which no suitable replacement land exists.

The Himba believe that building the dam will destroy their livelihoods and culture and have said they do not want the dam on their lands. Despite the existence of sizeable gas fields off the coast of Namibia, which could generate more than enough energy for Namibia, as well as great potential for solar and wind power, the government seems intent on building the scheme.

Successful initiatives against Dams

Around the world, civil society organisations have been successfully opposing the construction of large-scale dams. Four such initiatives are documented in the Encyclopedia of Sustainability, a project of Both ENDS that is published on the website. Click in the Encyclopedia of Sustainability on 'Integrated River Basin Management' to find a detail description of the four cases. Digital- or hardcopies can be requested for at: encylopedia@bothends.org

Protest stalls dam at Bujagali falls in Uganda

For example, in Uganda, local NGOs started an effective campaign against the Bujagali dam, which resulted in the withdrawal of ECA's from 3 Scandinavian countries, and the postponing of the World Banks continued support.

See the Encyclopediacase Saving the Nile River
http://www.bothends.org/encycl/cases/viewcase.php?cat=2&id=19&id_language=1

The Shelving of Arun III in Eastern Nepal

Likewise, Nepali NGOs joined forces against the Arun III Dam in Easter Nepal, which resulted in a shelving of the dam. Moreover, the case against Arun III was a landmark in Nepal and established the jurisdiction of the Supreme Court to investigate the legality of a development project. The case provided the Court a unique opportunity to interpret Article16 of the Constitution of Nepal, which pertains to the right to information. The principles and procedures established by the Court in the case of Arun III now stand as the most comprehensive legal framework on the right to information in the country in the absence of a separate law on this subject.

See the Encyclopedia case Successful Campaigning Against Large Dams
http://www.bothends.org/encycl/cases/viewcase.php?cat=2&id=23&id_language=1

Banas River Basin Development Plan in India

In cooperation with local communities, professional engineers and the government, the Indian NGO Econet took the lead in preparing a comprehensive development plan for the Banas river basin. This plan covers a very arid area in the state of Gujarat in northwestern India and was developed as an alternative to the controversial Narmada Sardar Sarovar dam and irrigation projects in the neighbouring states of Gujarat, Madhya Pradesh and Maharashtra (SSP).

The Banas river basin plan integrates dozens of old and modern techniques for local water management into one ingenious scheme, and presents a benefit comparison with the SSP.

Econet was invited to take part in a Task Force to study alternative development options on the Narmada River. The Task Force was appointed by the Chief Minister of the State of Madhya Pradesh in response to growing concerns and conflicts over the Narmada Valley Development Project (NVDP), which includes the construction of the Sardar Sarovar dam. The Task Force incorporated most of the techniques and approaches developed for the Banas basin development plan. In 1998, the government of Madhya Pradesh, in principle, accepted the Task Force's report.

See the Encyclopedia case Restoring degraded watersheds and securing livelihoods http://www.bothends.org/encycl/cases/viewcase.php?cat=2&id=5&id_language=1

The role of small dams in rural Brazil

In Brazil, cooperatives of rural electrification were established to provide electricity to the countryside, something that the state companies for energy distribution did not do. Cooperatives received a governmental authorization to provide energy only to its partners. Initially, these cooperatives of rural electrification depended on large hydroelectric dams and companies for energy, and distributed only what was bought from these companies.

In the last few years, a new electricity model was created in Brazil and the state monopoly over the system was broken. Most of the distributing companies became private. The government made rules and regulations that benefited big companies that have bought the state system, which makes it difficult for the cooperatives to be on the market.

In answer to this new situation, cooperatives of rural electrification are finding mechanisms to cope in these circumstances, and to depend less on big corporations by using their own distributing networks, investing money to produce their own energy: they are also looking for an articulation between cooperatives.

In 1998, the cooperative CRERAL (Cooperativa Regional de Eletrificação Rural do Alto Uruguai LTDA) started a series of studies about the energy generation with PCH's initiated the construction of Abaúna PCH, which was completed in 2000. In 2001, the energy generated by the Abaúna Dam was 3,822 MW/h, almost 26% of the energy distributed by the cooperative. The PCH Cascata das Andorinhas Dam, which is presently being constructed, will have a potential capacity of 1,000KW and will be ready in May 2003. Together, these two PCH's will produce 50% of the actual consumption of CRERAL. At present CRERAL is studying the possibility of building two other PCH's, with other cooperatives of rural electrification from Rio Grande do Sul.

See the Encyclopedia case Taking energy to the people http://www.bothends.org/encycl/cases/viewcase.php?cat=2&id=93&id_language=1

The World Commission on Dams

The World Commission on Dams (WCD) was launched in 1998, by its two sponsoring organizations, the World Bank and IUCN-The World Conservation Union. The WCD is now independent of its sponsors. The Commission's mandate sets it two "overarching goals" - "to review the development effectiveness of dams and assess alternatives for water resources and energy development"; and "to develop internationally-accepted standards, guidelines and criteria for decision-making in the planning, design, construction, monitoring, operation and decommissioning of dams". The mandate also instructs the WCD to carry out case studies of individual dam projects and of complete river basins, and for its results to include "an understanding of the accuracy of predictions of costs and benefits used in the dam planning process" and of "the need for restoration and reparation where necessary".

The initiative to set up a dam review commission began at an international conference of dam-affected people held in Curitiba, Brazil in March 1997. The Curitiba Declaration calls for an end to

large dam building until a number of conditions are met including the establishment of an "international independent commission . . . to conduct a comprehensive review" of large dams. The 12 Commission members came from a variety of backgrounds, representing a broad spectrum of interests in large dams – including governments and NGOs, dam operators and grassroots people's movements, corporations and academics, industry associations and consultants.

What did the WCD do?

The WCD relied on extensive public consultation and commissioned a large volume of research. An associated Forum with 68 members from 36 countries representing a cross-section of interests, views and institutions was consulted during the Commission's work. The $10 million necessary to fund the Commission came from more than 50 governments, international agencies, private corporations (including many of the main dam industry multinationals), private charitable foundations and NGOs.

To conduct the most comprehensive and independent review of the world's dams to date, and base its conclusions on a solid foundation, the WCD commissioned and assessed:

- In-dept case studies of eight large dams on five continents, and papers assessing the overall dam-building records of China, India and Russia;
- 17 thematic reviews on social, environmental, economic and financial issues; alternatives to dams; different planning approaches and environmental impact assessments;
- brief reviews of 125 large dams in 56 countries;
- four public hearings in different region; and
- 950 submissions by interested individuals, groups and institutions.

The Commission's final report*, Dams and Development; A New Framework for Decision-Making*, was released in November 2000.

What were the WCD's main findings?

The WCD found that while "dams have made an important and significant contribution to human development, and benefits derived from them have been considerable … in too many cases an unacceptable and often unnecessary price has been paid to secure those benefits, especially in social and environmental terms, by people displaced, by communities downstream, by taxpayers and by the natural environment." Applying a "balance-sheet" approach to assess the costs and benefits of large dams that trades off one group' s loss with another's gain is seen as unacceptable, particularly given existing commitments to human rights and sustainable development.

The WCD's final report provides ample evidence that large dams have failed to produce as much electricity, provide as much water, or control as much flood damage as their supporters originally predicted. In addition, these projects regularly suffer major cost overruns and time delays. Furthermore, the report found that:

- Large dams have forced 40-80 million people from their homes and lands, with impacts including extreme economic hardship, community disintegration, and an increase in mental and physical health problems. Indigenous, tribal and peasant communities have suffered disproportionately. People living downstream of dams have also suffered from water-borne diseases and the loss of natural resources upon which their livelihood depended.
- Large dams cause great environmental damage, including the extinction of many fish and other aquatic species, huge losses of forest, wetlands and farmland.
- The benefits of large dams have largely gone to the rich while the poor have borne the costs.

What were the WCD's recommendations?

The Commission provides a new framework for decision-making on water and energy projects based on recognising the rights of, and assessing the risks to, all stakeholders. Those who would be

adversely affected should participate in the planning and decision-making process and have a share in project benefits. The Commission's main recommendations include the following:

- No dam should be built without the "demonstrable acceptance" of the affected people, and without the free, prior and informed consent of affected indigenous and tribal people.
- Comprehensive and participatory assessment of people's water and energy needs, and different options for meeting these needs, should be developed before proceeding with any project.
- Priority should be given to maximising the efficiency of existing water and energy systems before building any new projects.
- Periodic participatory reviews should be done for existing dams to assess such issues as dam safety, and possible decommissioning.
- Mechanisms should be developed to provide reparations, or retroactive compensation, for those who are suffering from existing dams, and to restore damaged ecosystems.

This and more information can be found in the *Citizens' Guide to the World Commission on Dams* published by the International Rivers Network (IRN) in 2002. This Citizens' Guide is intended as a tool for people in their struggles for social justice and environmental protection and can be ordered at the IRN.

With the launch of its Final Report, the WCD completed its mandate and, after a one year dissemination phase, the WCD Secretariat disbanded in October 2001. However the WCD-site is still on the web and can be visited at www.dams.org.

The Dams and Development Project (DDP), hosted by the United Nations Environment Programme (UNEP) and established on 1 November 2001, is a two-year follow-on activity to the work of the WCD.

Please visit www.unep-dams.org for information about follow-up initiatives around the world, reactions to the Report and submissions on good practice. The DDP also distributes copies of the report overview and WCD CD-Rom.

Call for Action !!
International Day of Action Against Dams and for Rivers, Water, and Life on March 14th 1997

Water for life, not for death! These words resounded at the First International Meeting of People Affected by Dams held in Curitiba, Brazil in March, 1997. From many countries including Taiwan, Brazil, Chile, Lesotho, Argentina, Thailand, Russia, Europe, and the United States, the dam-affected came together to share successes, failures, and experiences. In the Declaration of Curitiba, the delegates state:

Over the years, we have shown our growing power. We have occupied dam sites and offices, marched in our villages and cities, refused to leave our lands even though we have faced intimidation, violence and drowning. We have unmasked the corruption, lies and false promises of the dam industry...

We are strong, diverse and united and our cause is just. We have stopped destructive dams and have forced dam builders to respect our rights. We have stopped dams in the past, and we will stop more in the future.

To reinforce our movement we will build and strengthen regional and international networks. To symbolise our growing unity, we declare that 14 March, the Brazilian Day of Struggles Against Dams, will from now on become the International Day of Action Against Dams and for Rivers, Water, and Life.

Remember to mark the date, March 14th, and think about what you and your organisation might do in your national/regional/local areas. No action is too large or small. You might participate by staging a demonstration, organising a river clean-up or educational forum, or writing a letter to your local newspaper. There are no rules or stipulations for your event, only that it addresses the water

issues vital to your community or country.

The goal of your action might be to Demonstrate, Educate, or Celebrate. The important thing is to raise our voices in unison against destructive water development projects, reclaim the health of our rivers and watersheds, and demand the equitable and sustainable management of our waterways. By acting together, we will demonstrate that these issues are not merely local, but global in scope.

International Rivers Network (IRN, Aleta Brown, Campaign Associate) will act as the international information coordinator for this day of action. Please be sure to keep us updated on any action that your group is planning and we will share that information with other participating groups and the media. By distributing information about each group's actions, we can accentuate the fact that these are international issues, that our experiences are connected, and that we can learn from each other's experiences.

In 2002, 26 countries all over the world organized activities on the 14th of March.

DECLARATION OF CURITIBA

Affirming the Right to Life and Livelihood of People Affected by Dams, Approved at the First International Meeting of People Affected by Dams, Curitiba, Brazil, March 14, 1997

We, the people from 20 countries gathered in Curitiba, Brazil, representing organisations of dam-affected people and of opponents of destructive dams, have shared our experiences of the losses we have suffered and the threats we face because of dams. Although our experiences reflect our diverse cultural, social, political and environmental realities, our struggles are one.

Our struggles are one because everywhere dams force people from their homes, submerge fertile farmlands, forests and sacred places, destroy fisheries and supplies of clean water, and cause the social and cultural disintegration and economic impoverishment of our communities.

Our struggles are one because everywhere there is a wide gulf between the economic and social benefits promised by dam builders and the reality of what has happened after dam construction. Dams have almost always cost more than was projected, even before including environmental and social costs. Dams have produced less electricity and irrigated less land than was promised. They have made floods even more destructive. Dams have benefited large landholders, agribusiness corporations and speculators. They have dispossessed small farmers; rural workers; fishers; tribal, indigenous and traditional communities.

Our struggles are one because we are fighting against similar powerful interests, the same international lenders, the same multilateral and bilateral aid and credit agencies, the same dam construction and equipment companies, the same engineering and environmental consultants, and the same corporations involved in heavily subsidised energy-intensive industries.

Our struggles are one because everywhere the people who suffer most from dams are excluded from decision-making. Technocrats, politicians and business elite who increase their own power and wealth through building dams instead take decisions.
Our common struggles convince us that it is both necessary and possible to bring an end to the era of destructive dams. It is also both necessary and possible to implement alternative ways of providing energy and managing our freshwaters which are equitable, sustainable and effective.

For this to happen, we demand genuine democracy, which includes public participation and transparency in the development and implementation of energy and water policies, along with the

decentralisation of political power and empowerment of local communities. We must reduce inequality through measures including equitable access to land. We also insist on the inalienable rights of communities to control and manage their water, land, forests and other resources and the right of every person to a healthy environment.

We must advance to a society where human beings and nature are no longer reduced to the logic of the market where the only value is that of commodities and the only goal profits. We must advance to a society which respects diversity, and which is based on equitable and just relations between people, regions and nations.

Our shared experiences have led us to agree the following:

1. We recognise and endorse the principles of the 1992 'NGO and Social Movements Declaration of Rio de Janeiro' and the 1994 'Manibeli Declaration' on World Bank funding of large dams.
2. We will oppose the construction of any dam, which has not been approved by the affected people after an informed and interactive decision-making process.
3. We demand that governments, international agencies and investors implement an immediate moratorium on the building of large dams until:
   a. There is a halt to all forms of violence and intimidation against people affected by dams and organisations opposing dams.
   b. Reparations, including the provision of adequate land, housing and social infrastructure, are negotiated with the millions of people whose livelihoods have already suffered because of dams.
   c. Actions are taken to restore environments damaged by dams - even when this requires the removal of the dams.
   d. Territorial rights of indigenous, tribal, semi-tribal and traditional populations affected by dams are fully respected through providing them with territories which allow them to regain their previous cultural and economic conditions - this again may require the removal of the dams.
   e. An international independent commission is established to conduct a comprehensive review of all large dams financed or otherwise supported by international aid and credit agencies, and its policy conclusions implemented. The establishment and procedures of the review must be subject to the approval and monitoring of representatives of the international movement of people affected by dams.
   f. Each national and regional agency which has financed or otherwise supported the building of large dams have commissioned independent comprehensive reviews of each large dam project they have funded and implemented the policy conclusions of the reviews. The reviews must be carried out with the participation of representatives of the affected people's organisations.
   g. Policies on energy and freshwater are implemented which encourage the use of sustainable and appropriate technologies and management practices, using the contributions of both modern science and traditional knowledge. These policies need also to discourage waste and over consumption and guarantee equitable access to these basic needs.
4. The process of privatisation which is being imposed on countries in many parts of the world by multilateral institutions is increasing social, economic and political exclusion and injustice. We do not accept the claims that this process is a solution to corruption, inefficiency and other problems in the power and water sectors where these are under the control of the state. Our priority is democratic and effective public control and regulation of entities which provide electricity and water in a way

that guarantees the needs and desires of people.

5. Over the years, we have shown our growing power. We have occupied dam sites and offices, marched in our villages and cities, refused to leave our lands even though we have faced intimidation, violence and drowning. We have unmasked the corruption, lies and false promises of the dam industry. Nationally and internationally we have worked in solidarity with others fighting against destructive development projects, and together with those fighting for human rights, social justice, and an end to environmental destruction.

We are strong, diverse and united and our cause is just. We have stopped destructive dams and have forced dam builders to respect our rights. We have stopped dams in the past, and we will stop more in the future.

We commit ourselves to intensifying the fight against destructive dams. From the villages of India, Brazil and Lesotho to the boardrooms of Washington, Tokyo and London, we will force dam builders to accept our demands.

To reinforce our movement we will build and strengthen regional and international networks. To symbolise our growing unity, we declare that 14 March, the Brazilian Day of Struggles Against Dams, will from now on become the International Day of Action Against Dams and for Rivers, Water, and Life.

Águas para a vida, não para a morte!
¡Aguas para la vida, no para la muerte!
Water for life, not for death!

The Encounter, by Madhu Ramnath, India

"Hey mister, you are vacating this place please."
"Why for?"
"Public purpose. One dam is coming nearby."
"Dam?"
"Yes, very big dam. Costing many many scores of dollars."
"Dollars?"
"Dollars! You not knowing dollars? Many rupees make one dollar, just like many paisa making one rupee."
"Wherefrom all this dollar is coming?"

"From American bank of world. They give you new house somewhere else."
"But why I am going for dam?"
"Not only you going, idiot, whole village going!"
"How? Village not bullock cart to move anywhere. Not even one step."
"You are not understanding. Listen. Many villages, more than two hundred, going. Simply no problem."
"For who no problem?"
"For nobody."
"But why you are calling dam here?"
"Because holy Narmadaji is residing here."
" Then why they are damming?"
"Public purpose only."
"What that is being?"
"Simply too much electricity coming and making day of your night. And no more drought and thirst. People on top feeling too sad about people in drought time."
"Yes, yes. But why I am going?"
"Because otherwise you are underwater."
"But what about fields and hill slopes? They also going underwater?"

"Everything. Simply."
"Then how I am living without land?"
"No problem. That we are arranging. How much land you are wanting? You are having three acre now? We give you five in other place. And also water and dollars. Sign here please."
"You are doing same for all two hundred villages?"
"Simply. But you worry about yourself only."
"How you are moving two hundred villages? Baba Re, some are sure to get lost."
"Trucks. At present we are preparing road up to here."
"You say you give five acre. But you five forest also?"
"What for you want forest?"
"What for we want mother and father?"
"What for you want forest?"
"For many things. Leaves, fruit, wood, rope, plough, seeds, oil, eggs, honey, ants, meat, mushrooms, crabs, snails, fish, grass. And to sit without shame when the stomach hurts. And many things more."
"Why for you are wanting leaves? You are not having plates?"
"We are not using same plate every day. Like kings, we are using new plate every meal."
"Simply you are wasting national property. After dam we are giving money for plates also. You are buying good aluminium plate. And why for you eating snakes and worms? Good people eating rice and wheat. And why for you sit in open to shit? We build you new place for that also."
"What? We are not sitting in same place everyday. What things you talk?"
"You are not understanding. There is one thing flush we are also supplying. Simply it is making new place everyday."
"But plates and money and this flush thing not same as forest."
"Why? What more you are getting from forest?"
"What you are getting from father and mother?"
"What more you are wanting from forest?"
"Understand please. I am not wanting from forest. I am wanting forest."
"Yes yes now I am seeing. You are wanting forest. That we are providing also. After dam is coming we are vacating forest on other side and making wildlife sanctuary. For conservation purpose."
"And where you are vacating those people?"
"Simply we are providing housing and other facilities for them also. But that is other thing. You are getting forest. Sign here please."
"I am not understanding. Before we are having sometime drought. Now you are bringing flood. There is no other way?"
"That also we are considering later. But now dam is coming."
"I am thinking and talking with other people. Dam waiting little bit?"
"Sorry public purpose not wait for one person only. Sign here please...."

Organisations

INTERNATIONAL

Bank Information Centre
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Provides information on policies and specific projects of the World Bank and Regional Development Banks. Facilitates lobby also related to large Dams funded by these institutions.

Centre for International Environmental Law
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The Centre for International Environmental Law (CIEL) is a public interest, not-for-profit environmental law firm founded in 1989 to bring the energy and experience of the U.S. public interest environmental movement to the critical task of strengthening and developing international and comparative environmental law, policy, and management around the world.
CIEL's goals are to solve environmental problems and promote sustainable societies through the use of law; to incorporate fundamental principles of ecology and democracy into international law; to strengthen national environmental law systems and support public interest movements around the world, and to educate and train public-interest-minded environmental lawyers. CIEL provides a full range of environmental legal services in both international and comparative national law, including: policy research and publication, advice and advocacy, education and training, and institution building.
To achieve its goals, CIEL works throughout the world with non-governmental organisations, international institutions, and states, especially developing nations, and those with economies in transition. CIEL's work covers more than 60 countries on six continents, with emphasis on the Western Hemisphere, Central and Eastern Europe and the Newly Independent States, and Asia. CIEL is assisting several NGOs to present their case to the independent inspection panel of the World Bank. Among them the Yacyreta case in Paraguay/Argentina.

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International Rivers Network (IRN) is an NGO dedicated to protecting and restoring the world's rivers and watersheds for the benefit of the people and ecosystems that depend on them. Over the past ten years they have worked to promote the wise management of the planet's freshwater resources, to link environmental protection with human rights, to create a worldwide understanding of river ecology, and to reveal the interdependence of rivers' biological, physical and cultural aspects. They support and promote the work of local organisations around the world striving to protect rivers and watersheds, and empower these groups by connecting them to each other. Through research into alternative energy generation, irrigation and flood management schemes, pressure for policy reform at international finance institutions such as the World Bank, and active media and educational campaigns around the world, IRN works to discourage investment in destructive large-scale river development while encouraging strategies that are more environmentally, socially and economically sound.
IRN maintains a library of information related to river development and alternative management options in more than 90 countries, and involving nearly a thousand local and regional organisations. They also have a library of videotapes, slides, and photographs. IRN's quarterly newsletter, World Rivers Review, provides news, updates on ongoing campaigns and alternative river management strategies, and introduces other like-minded organisations.
IRN's small size precludes it from providing full-scale assistance to every individual or organisation involved in an important river protection campaign. However, IRN typically provides some level of assistance to approximately 30 campaigns annually.
IRN is currently involved in campaigns on the following dams: Three Gorges Dam (China), Pangue Dam/Biobio River (Chile), Mekong, Narmada/Sardar Sarovar Project (India), Bakun Dam (Malaysia), Lesotho Highlands Water Project and the Epupa Dam (Namibia).

Probe International
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Probe International exposes the devastating environmental, social, and economic effects of Canada's aid and trade abroad. Probe works to hold accountable government agencies such as the Canadian International Development Agency, the Export Development Corporation, and the World Bank, as well as Canadian corporations, for damages they inflict on developing nations.
Campaigns: Three Gorges Dam Project in China and the dam projects in the Mekong region in Southeast Asia.

Project Underground
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Their mission: Exposing corporate environmental and human rights abuses. Supporting communities facing the mining and oil industries.
Project underground is an environmental and human rights organisation that supports communities facing mining, oil and gas activities. In the United States, project underground works with a variety of movement organisations on the important problems and issues of the global oil, gas and mining industries. Project Underground targets the range of interests from industry insurers to investors to the public, in order to introduce corporate accountability to these sectors. We also work to develop an ethic of consumer responsibility for efficient and sustainable mineral use.

LATIN AMERICA

Fundación Proteger
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Created in 1991
Campaign: Paraná Medio, Paraná River, Argentina.
In the middle of the Paraná River in Argentina the first privately financed mega-dam in Latin America is planned. Fundación Proteger together with national organisations such as Taller Ecologista in Rosario and the Asociación de Entidades Ambientalistas de la Cuenca del Paraná in Paraná are undertaking activities in opposition to the proposed dam. The strength of the local opposition is indicated by a recent plebiscite on construction of the Corpus Dam on the Paraná River, where 90% voted "no". Environmental groups are working to develop sustainable development alternatives for the middle Paraná basin, and are advocating implementation of energy efficiency measures and conservation to eliminate the need for the energy that Paraná Medio would generate.

MAB - Movimento dos Atingidos por Barragens (Movement of Dam-Affected People)

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MAB is the fruit of 13 years of organised opposition to large dams in Brazil. As a result of experiences in many regions of the country, a national movement has been formed of dam victims. Their key activities have been to fight for just compensation and to resist the Brazilian government's plans for a vast new dam network. MAB consists of ten region organisations. It has succeeded in mobilising large numbers of Brazilian people who oppose these mega-projects, and in some cases has managed to suspend the projects altogether. In the Amazon, MAB has joined indigenous

peoples in opposing dams on the Xingu River; and in the south, MAB forced the cancellation of the Salto Capanema and Machadinho Dams. MAB had an active panel of advisors, which include representatives of the Institute for Urban and Regional Research and Planning (IPPUR), IBASE, CPT, FASE and CPI-SP.

Rede Brasil
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Website: www.rbrasil.org.br

Campaigns: Itaparica Hydroelectric dam, São Francisco River, state of Bahia and Pernambuco in Northeast Brazil.
Rede Brasil, together with many other organisations in Brazil have presented this case to the Independent Inspection Panel of the World Bank.

Grupo de Acción por el Biobio (GABB)
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Campaign: Pangue and Ralco, Biobío River, Chile. GABB was created to mobilise populations, including Pehuenche indigenous people, who oppose a series of proposed dams on Chile's Biobío River. GABB and the Pehuenche are currently working together to propose alternatives to Ralco, the second dam planned for Biobío.

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Coordinadora Nacional Ambientalista (CNA)
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Campaign: Patuca II Project.

Centro Mexicano de Derecho Ambiental (CEMDA)
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Fax: +52-55-5211.2593
E-mail: general@cemda.org.mx
Website: www.cemda.org.mx

Campaign: El Cuchillo, San Juan River, Nuevo Leon, Mexico.

Sobrevivencia - Amigos de la Tierra
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E-mail: coordina@sobrevivencia.org.py
Website: www.sobrevivencia.org.py

Campaigns: Yacyreta, Paraná River, Paraguay/Argentina and Puerto Caballo, Paraguay River near the common border of Brazil, Bolivia and Paraguay.

ASIA

Rivers Watch East and Southeast Asia –RWESA
Contact person: Joan Carling
Address: p/o Cordillera People's Alliance, 53D First Road, Palma, Baguio City, 2600 - PHILIPPINES
Phone: +63-74-442.21.15
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E-mail: contact@rwesa.org
Internet: www.rwesa.org

Rivers Watch East and Southeast Asia is a network of NGOs and peoples' organizations from East and Southeast Asia. The network is to stop destructive river development projects in East and SE Asia and to restore rivers to the communities who depend on them. The network currently consists of around 35 organizations from East and Southeast Asia.

Narmada Bachao Andolan - Save the Narmada
Contact person: Medha Patkar
Address: B-13 Shivam Flats, Ellora Road Baroda, Gujarat 390007 - INDIA
Phone/Fax: +91-265-382232
E-mail: medha@narmada.org
Internet: www.narmada.org

Campaign: Sardar Sarovar Project, Narmada River, Western India.
NBA is a mass-based people's movement fighting the Sardar Sarovar Dam. NBA consists of project-affected people in over 300 villages, with support centres in 60 major cities and towns inside India and a strong international network as well. For twelve years, NBA has studied, documented, disseminated and fought the impacts, supposed cost benefits, and viability of the Sardar Sarovar Dam. They have also networked extensively with other large dams struggles in India and have taken the initiative to formulate alternative policy frameworks, plans for water and energy, and social structure around the issue.

Friends of the Earth Japan
Contact person: Ms Ikuko Matsumoto
Address: 2F 3-17-24, Mejiro Toshima-ku, Tokyo 171-0031 - JAPAN
Phone: +81-3-3951.1081
Fax: +81-3-3951.1084
E-mail : aid@foejapan.org
Website: www.foejapan.org/en

Public Interest Research Group
Address: 142, Maitri Apartments, Plot # 28, Indraprastha Ext., New Dehli, 110092 - INDIA
Phone: +91-11-2432054
Fax: +91-11-2224233
E-mail: kaval@pirg.unv.ernet.in

They publish the PIRG Update with information on dams.

Tehri Bandh Virodhi Sangharsh Samiti
Address: c/o Hotel Riverview, Tehri, Uttar Pradesh - INDIA
Phone: +91-37-684441
Fax: +91-37-684666

Campaign: Tehri Dam, Bhagirathi (Ganga) River, India.

Water and Energy Users' Federation-Nepal (WAFED)
Contact person: Gopal Siwakoti 'Chintan' (Executive Director)
Mail Address: P.O. Box 2125, Putalisadak, Kathmandu - NEPAL
Phone: +977-1-429741
Fax: +977-1-419610
E-mail: wafed2001@hotmail.com or inhured@enet.com.np

Campaign: Arun III, Nepal.

TERRA (Towards Ecological Recovery and Regional Alliance)
Address: 409 Soi Rohitsuk, Pracharajbampen Road, Bangkok 10320 - THAILAND
Phone: +66-2-6910718
Fax: +66-2-6910714
E-mail: terraper@comnet.ksc.net.th
Website: www.terraper.org

TERRA publishes the magazine "Watershed" 3 times a year, which covers issues of environment and local communities in the Mekong region. They monitor dams in Laos and development projects in Burma, Cambodia, Vietnam and Thailand.

Wildlife Fund Thailand
Contact persons: Chainarong Srettachua, Seng Kwanyuan (community leader in Northern Thailand)
Address: 251/88-90 Pahonyothin Road Bangkhen, Bangkok 10220 - THAILAND
Phone: +66-2-521-3435 / 552-2111 / 552-2790
Fax: +66-2-5526083
E-mail: pisitnp@mozart.inet.co.th or info@wildlifefund.or.th
Website: www.levantenet.com/wildlifefund

Campaigns: Srinakharin Dam, Kuao Laem Dam, Pak Moon Dam, and Bang Lang Dam.

Cordillera Peoples Alliance
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The Cordillera Peoples Alliance, a grassroots movement of Indigenous

peoples of Northern Philippines, is campaigning against the San Roque dam.

AFRICA

Integrated Rural Development and Nature Conservation (IRDNC)
Contact person: Margaret Jacobsohn
Address: Box 339, Swakopmund - NAMIBIA
Fax: +264-61-239799
E-mail: irdnc@iafrica.com.na

Dam: Epupa Hydroelectric Scheme.

Conseil des Organisations Non-Gouvernementales d'Appui au Developpement (CONGAD)
Contact person: Mr. Youssouf Cisse (Vice-president)
Address: Sicap Amitié 1, Villa 3089 bis BP 4109 Dakar - SENEGAL
Phone: +221-244116
Fax: +221-244413
E-mail: congad@telecomplus.sn

Campaign: Manantali, Senegal.

National Association of Professional Environmentalists (NAPE)
Contact person: Frank Muramuzi
Address: P.O. Box 2909, Kampala - UGANDA
Phone/Fax: +256–41–534453 / +256-77-425270
E-mail: napesbc@afsat.com

Campaign: Bujagali Power Project.

EUROPE

Aktionsgemeinschaft Solidarische Welt (ASW)
Contact person: Bruni Weissen
Address: Hedemannstrasse 14, 10969 Berlin 61 - GERMANY
Phone: +49-30-2594.0801
Fax: +49-30-2594.0811
E-mail: mail@aswnet.de
Website: www.aswnet.de

Campaigns: Maheshwar Dam and the Narmada Project in India.

Urgewald - Kampagne für den Regenwald
Contact person: Heffa Schucking
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Phone: +49-25-831031
Fax: +49-25-834420
E-mail: urgewald@urgewald.de
Internet: www.urgewald.org

Campaign: Manantali Dam projects and resettlement scheme, Senegal.

Bern Declaration
Contact person: Christine Eberlein
Address: Quellenstr. 25, P.O. Box 1327, 8031 Zürich - SWITZERLAND
Phone: +41-1-277.7000
Fax: +41-1-277.7001
E-mail: evb@access.ch
Internet: www.evb.ch

The Berne Declaration is involved in campaigns regarding the Three Gorges Project, the Ilisu Dam in Turkey and ABB's involvement in large dams (in 1998 it published an independent review of ABB's hydropower strategy).

Both ENDS
Nieuwe Keizersgracht 45, 1018 VC Amsterdam - THE NETHERLANDS
Phone: +31-20-6230823
Fax: +31-20-6208049
E-mail: water@bothends.org
Internet: www.bothends.org

Campaigns: Bujagali, Narmada, Yacyreta, Theri, Mekong.

Association for International Water and Forest Studies (FIVAS)
Contact person: Tonje Folkestad
Address: Solidaritetshuset, Osterhausgate 27, 0183 Oslo - NORWAY
Phone: +47-22-989325
Fax: +47-22-989301
E-mail: fivas@fivas.org
Internet: www.solidaritetshuset.org/fivas

The Association for International Water and Forest Studies (FIVAS) is an independent organization working to obtain and disseminate information about the consequences of large dams and hydropower projects in the Third World, and to prevent Norwegian participation in projects with significant social or environmental impacts. Their activities are based on cooperation with local organizations and activists in the Third

World. They keep an eye on hydropower developments where Norwegian companies or institutions are involved. They also focus on Norway's role in international finance institutions, such as the World Bank.

Campaigns: Guaigüí multipurpose dam in The Dominican Republic and the Bujagali Project.

Swedish Society for Nature Conservation
Contact person: Goran Ek
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Internet: www.snf.se/english.cfm

The Swedish Society for Nature Conservation was founded in 1909. With its 170,000 members, it is the largest and oldest environmental organization in Sweden. In the recent past, the BD and SSNC opposed ABB hydropower projects such as Bakun.

Further Reading

Large Dams: Learning from the Past, Looking to the Future,
A joint publication of the IUCN-The World Conservation Union and the World Bank Group. January 1998 (150 pp).

Large dams have been a subject of growing international debate and controversy. They have played a key role in economic development, serving a variety of purposes, including electricity generation, flood control, and irrigation. Yet concern about their adverse environmental, social, and even economic impacts is growing.
In 1996 the World Bank's Operations Evaluation Department completed an internal review of 50 large dams funded by the Bank. IUCN-The World Conservation Union and the World Bank jointly hosted a workshop in Gland, Switzerland, in April 1997 to discuss the findings of the review and the need for further study.
The workshop brought together representatives from governments, the private sector, international financial institutions, and civil society organisations to address the advances needed in knowledge and practice, the methodologies and approaches required to achieve these advances, and proposals for a follow-up process involving all stakeholders.
Two days of working together resulted in a path-breaking consensus on how to move forward. It was agreed that the IUCN and the Bank would establish by November 1997 a two-year international commission, whose mandate is to review the development effectiveness of dams and to develop standards, criteria, and guidelines to advise future decision-making. Part I of these proceedings summarises the workshop discussion and recommendations for future action. Part II contains a series of overview papers commissioned for the workshop on four key topics: engineering and economics; social and stakeholder issues; environmental sustainability; and future challenges facing the hydro industry.

From Farmers to Fishers: Developing Reservoir Aquaculture for People Displaced by Dams (Indonesia) World

Bank Technical Paper No. 369. by Barry A. Costa-Pierce, January 1997 (68 pp).

Hydropower and irrigation projects involving reservoirs can displace thousands of people from their traditional lands and deprive them of their livelihoods. If poorly planned, they can also lead to environmental degradation. Solutions to these problems must be found--solutions that are technically feasible, sustainable, environmentally appropriate, and acceptable to the people who are resettled. This paper explains how the planned, integrated development of fishery ecosystems in reservoirs not only can mitigate the negative social consequences of dam construction, but also can enhance the economic benefits from hydropower and irrigation projects in many developing countries. The paper draws on the success of fish farming efforts in the Saguling and Cirata reservoirs in Java, which attests to the potential for creating employment in reservoirs that are in place and under construction around the world.

Both Sides of the Dam, symposium program of the day and the abstracts of the presentations of the speakers, 22nd February 1995, Waterbouwdispuut & NOVIB, Delft, the Netherlands. Including case studies: Itaipú Project (Brazil/Paraguay), Pak Mun Dam, Thailand, Waza Longone Project (wetland restoration), Cameroon.

Hydroelectric Dams on Brazil's Xingu River and Indigenous People, Leinad Ayer de O. Santos, Lúcia M.M. de Andrade, Pro-Indian Commission of São Paulo. Published by Cultural Survival, Inc. Cambridge, Massachusetts, 1990.

Dam the Rivers, Damn the People, Development and Resistance in Amazonian Brazil, by Barbara J. Cummings, Earthscan Publications Ltd. London, 1990.

Damming the Three Gorges: What Dam Builders don't Want you to Know, Updated and expanded, 1993 (183 pp).

A comprehensive critique of the Three Gorges Water Control Project Feasibility Study, edited by Probe International. Nine independent experts express their professional outrage at a Canadian government-financed study that recommends building the Three Gorges dam in China, which would require the forcible relocation of one million people and the destruction of one of the world's most magnificent canyons.

The Mekong Currency: Lives and Times of a River, by Liesbeth Sluiter, edited and introduction by Gráinne Ryder of Probe International, 1993 (168 pp).

Poignant text and stunning photos portray the Mekong River and its people in Laos, Thailand, Cambodia and Vietnam and show how development projects and hydro dams are threatening communities which depend on the river for survival. *An Assessment of the Kalabagh Dam Project on the River Indus*, Pakistan, by Muhammad Nasir Gazdar, 1990 (93 pp).

This publication of the Environmental Management Society examines the social, environmental, and economic impacts of the Kalabagh dam in Pakistan.

Yangtze! Yangtze! Edited by Probe International, 1994 (295 pp).

An extraordinary collection of interviews, essays, and statements by Chinese scientists, journalists, and intellectuals opposed to the massive Three Gorges dam on China's Yangtze River. Originally published in 1989 as the democracy movement was gathering momentum, Yangtze! Yangtze! is credited with pressuring the State Council to postpone the dam, and inspired the democracy movement by striking an unprecedented blow at powerful state authorities promoting the dam. This pioneering critique is now available in English, expanded to include post-Tiananmen events.

The Three Gorges Dam in China: Forced Resettlement, Suppression of Dissent and Labor Rights Concerns, February 1995 (48 pp).

This paper released by Human Rights Watch/Asia includes leaked security documents which reveal, among other things, that the Chinese government is preparing for civil uprisings over its forced resettlement program.

Silenced Rivers, The Ecology and Politics of Large Dams, by Patrick McCully, IRN Campaigns Director. Published by Zed Books, with International Rivers Network and The Ecologist. Enlarged and Updated edition, 2001 (360 pages).

Silenced Rivers explains the history and politics of dam building worldwide and shows why large dams have become the most controversial of technologies. It describes the many technical, safety and economic problems, which afflict the technology, the structure of the international dam-building industry, and the role played by international banks and aid agencies in promoting the technology in the South. Silenced Rivers also tells the story of the rapid growth of the international anti-dam movement. It stresses how replacing large dams with less destructive alternatives will depend upon the opening up of the dam industry's practices to public scrutiny.

A Watershed in Global Governance? An Independent Assessment of the World Commission on Dams, World Resources Institute, 2001 (136 pp).

Citizen's Guide to the World Commission on Dams, by Imhof, A., S. Wong and P. Bosshard, IRN Berkeley, USA 2002.

The Citizen's Guide to the World Commission on Dams is intended as a tool for people in their struggle for social justice and environmental protection.

Development Disasters: Japanese-funded Projects in Asia, A publication of Rivers Watch East and Southeast Asia (RWESA), IRN and FOE-Japan, ed. A. Imhof, March 2003 (54 pp).

Features case studies of six Japanese-funded dam projects at various stages of implementation.

Dammed Rivers, Damned Lies: What the water establishment doesn't want you to know, A briefing kit for the Third World Water Forum in Kyoto, Japan, published by FOE-Japan and IRN, March 2003 (18 pp).

Audiovisuals

Dammed, Narrated by David Suzuki, this program takes a critical look at large-scale hydro dams around the world. $20.00 deposit. (60 minutes, VHS videotape)

Valley Refuses to Die. Produced in India, this powerful documentary portrays the ongoing life and death struggle in India to stop the Narmada Valley Project. The project, which has World Bank support, would dam the sacred Narmada River with 30 large dams, 300 medium dams, and 3,000 small ones. Tribals and peasants who will be flooded off their land talk frankly to the camera.

The Drowning, The effect of the Bakun Dam on the People, Environment and Country, 18 minutes, Malaysia.

Internet Resources

Large part of the information for this package has been published by the International Rivers Network on their website: http://www.irn.org

Berne Declaration: http://www.evb.ch/kampagne.cfm?folder_id=159

Friends of River Narmada: http://www.narmada.org

Probe International: http://www.probeinternational.org

Rivernet: http://www.rivernet.org

World Commission on Dams: http://www.dams.org

World Rainforest Movement: Dams and Megaprojects: http://www.wrm.org.uy/deforestation/dams.html