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Dam Greenwashing Flows at World Water Forum

By Zachary Hurwitz

The stated goal of this year's World Water Forum – the world's largest meeting devoted to water – is to create solutions to the water, energy, and food challenges presented by climate change and economic growth. However, some of the “solutions” being presented will do more to protect business-as-usual interests rather than spark innovative approaches to pressing water-related problems.

The sixth World Water Forum (this year in Marseille, France from March 12-17) is, like its predecessors, heavily weighted with corporate players, including many from the large-dam industry, making pitches for large-scale projects and private-sector approaches.

One corporate “solution” on the agenda this year, the Hydropower Sustainability Assessment Protocol (HSAP), proposes to replace the “best practice” recommendations of the World Commission on Dams with a voluntary, non-binding scorecard that allows dam builders to assess the social and environmental performance of each other's projects. HSAP is more about protecting the right to build large dams than the rights of the millions of people who depend on rivers for their daily needs. It is conceivable that HSAP could be used to greenwash some of the world's most destructive dams.



Ethiopia is building some of the world's most destructive dams, yet its national utility has been deemed a “Sustainability Partner” as part of the dam-greenwashing “HSAP” program.

The International Hydropower Association (IHA), a London-based organization of the world's most active dam builders, prepared the HSAP in cooperation with other institutions. Some of IHA's “Platinum Members” include the Three Gorges Corporation, Statkraft, Electricité de France (EDF), Itaipú Binacional, Odebrecht, and other dam-industry giants. IHA is heavily promoting the HSAP at the World Water Forum, and is seeking 20 countries to adopt the scorecard by 2015.

The Wrong Approach

The HSAP will do little to improve dam builders' commitments to social and environmental standards, because it lacks the teeth of regulations and safeguard policies. HSAP's voluntary approach does not hold dam builders accountable for human rights violations

committed during community resettlement, or for impacts on indigenous people, for example, because the HSAP does not require developers to comply with national legislation. HSAP will not prevent corruption, cost overruns, poor performance, or penalize dam builders in any monetary way, because it is not benchmarked against the world's highest social and environmental loan safeguards.

In fact, HSAP does not require dam builders to do anything at all. It only offers “good practice” and “best practice” guidelines that are quantified into a point system. Developers are rewarded points for voluntarily implementing better practices during the various stages of a hydropower project. It's a surprisingly inexact model for an industry based on precision engineering. It's also one

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Commentary

PADDLING UPSTREAM

Every day I encounter stories of hope and inspiration from people who are successfully advocating for rivers and their futures as “River People.”

Yet the challenge facing the world’s rivers are great, the consequences are stark and the window of opportunity for protecting them is narrowing.

As an organization and as part of a global network of civil society movements, International Rivers has been surveying the wild waters ahead: reading the currents, observing the gradient, and doing our best to predict what lies around the next bend in the river.

Yet with an unprecedented global dam rush bearing down on the remaining free-flowing rivers, we’re paddling upstream against a torrent. Indeed, in the course of a single human lifespan, we have so fragmented river systems – and their connection to meadows, floodplains and even the ocean – that we’re nearing a critical tipping point for sustaining freshwater biodiversity, riparian-based livelihoods, and the connectivity of essential planetary cycles. The next three to five years will be pivotal for our movement, and in turn for the fate of the world’s rivers.

Here’s a brief preview of what our network of supporters and allies can expect from International Rivers over the coming year.

With our courageous allies in Southeast Asia, we’ll continue to push for a 10-year moratorium on a series of dams proposed for the mainstream of the lower Mekong River, defending the world’s most productive freshwater fishery and the tens of millions of people the river nourishes.

We’ll be standing side by side with the people of the Amazon to fight the Belo Monte monster dam, and prepare for pending confrontations over the industrialization of the planet’s biggest, and perhaps most iconic, river. As I write, the Brazilian government is working to reduce the size of Amazonia National Park and other conservation units so they can be flooded by dams proposed on the Tapajos River, a major Amazon tributary. This move has been challenged in Brazil’s Supreme Court.

In Africa – a place of great hydrological uncertainty – we’ll work to ensure that proposed large dams take into account the risks of a changing climate. We’ll also be asserting a plan for addressing the continent’s acute energy poverty – a plan that protects African rivers, which serve as lifelines for the great majority of Africans.

While we resist destructive projects, we’ll also paddle our way “upstream,” to change the economic and legal drivers that are the source of the torrent of global dam-building we now face.

As our cover story reveals, International Rivers is working the World Water Forum to shine a light on a campaign by multinational energy corporations to greenwash dams through a bogus industry-created “sustainability” certification program.

Another dishonest booster of big dams will be in our sights in the coming year. “Carbon trading” is incentivizing destructive hydropower schemes across the globe – dam projects that are ruinous for rivers, perilous for people, and actually run counter to greenhouse gas reduction goals.

We’ll also follow the money back to Brazil for Earth Summit 2012 in June. Also called “Rio +20”, International Rivers will work to put rivers on the agenda in Rio, as we join civil society organizations from across the globe calling for community-led, not corporate-driven, solutions for energy access and water security for all.

We’ll also continue our constructive engagement with the world’s biggest dam-builder, China. Our dialogue with Chinese dam builders has resulted in the adoption of environmental and social standards that bring Sinohydro, the world’s largest dam-builder, up to international norms. With roughly 290 large dam projects being planned, designed or constructed outside its borders, we’ll work to compel Chinese dam-builders to meet their new commitments and reconsider their most destructive dam projects.

Looking even farther upstream, there’s still no approach for a global conservation plan for safeguarding the world’s remaining natural rivers. Very few countries have a mechanism for legal protection for the most outstanding natural rivers within their borders, and the innumerable “services” that well-functioning rivers provide to our economy and ecology. We’ll continue to help our partners bring these approaches into their national policy debates.

Paddling upstream on these issues will require creative thinking and quick action. Together, we’ll need to find the seams in the swift moving current, keep our boats in sync, and sometimes get out of the water and march when necessary. We’ll also need more paddles in the water – everyone can play their part in broadening the movement for rivers and against destructive dams that are blocking progress toward the most critical global justice and sustainable development solutions.

Jason Rainey

MAKING WAVES

In the News

“By moving under the radar of the Mekong River Commission, Thailand and Laos have threatened the spirit of regional co-operation and the integrity of the 1995 Mekong Agreement,” claims Piaporn Deetes of International Rivers, a pressure group. ”

“Further delays to a planned giant dam in Laos,” *The Economist*, Jan. 7, 2012

“No-bid contract, an air of secrecy, and repression of debate. Such a flawed planning process could doom the project from the start,” says International Rivers’ Africa campaigner Lori Pottinger. ”

“Ethiopia’s ‘grand dam’ rouses citizens, dismays critics,” *Christian Science Monitor*, Jan. 12, 2012

Korea’s Four Rivers Project Ruled Illegal – One River, Anyway

As we have previously reported, President Lee’s administration in South Korea has drawn tremendous criticism for promoting environmentally destructive projects under misleading green rhetoric. Activists, scientists, and ordinary citizens, both in Korea and abroad, have decried the egregious Four Major Rivers Restoration Project, a US\$21 billion pork barrel that is subjecting 900 km of rivers to needless “refurbishment” with dredging and dams. On February 10, the Busan District Court ruled in favor of 1,791 plaintiffs by declaring the Nakdong River portion of the Four Rivers Project to be illegal because the government proceeded without a proper economic assessment. The court, however, did not order the work to be canceled, claiming that such a reversal would “cause enormous confusion and harm public welfare.” The plaintiffs celebrate the spirit of this ruling as an important blow to the Four Rivers Project, but they plan to appeal to the Supreme Court.

Brazil’s Vale Voted Worst Corporation

Brazilian mining giant Vale was the people’s choice for the Public Eye Award, AKA the “Nobel Prize of Shame” for corporate misdeeds. The award was presented during the World Economic Forum in the Davos, Switzerland in January. The prize – created in 2000 by Switzerland’s Berne Declaration and Greenpeace to recognize a company’s record of environmental, social and labor violations – is selected annually through popular vote.

The company “won” in part for its leading share in the Belo Monte Dam, proposed for the Brazilian Amazon, as well as for record of labor and human rights violations at its mining projects in 38 countries. Vale competed for the award with a number of troublesome companies. More info: www.publiceye.ch

Nu River Mining Project Stopped

After a year-long struggle, Tibetan villages in Yunnan, China, have successfully halted a gold mining project on Mount Kawagebo, which borders the Three Parallel Rivers World Heritage Site.

In February 2011, a gold mining company began operating near the village of Abin without prior consultation or consent of the local people. When villagers attempted to negotiate with the mining company, agents hired by the company and local police began threatening and harassing them. In January 2012, 200 villagers surrounded the police station after a local villager was arrested, and a riot ensued. The leader was released, but the protests continued as villagers demanded closure of the mine. Hundreds more villagers from the surrounding area joined in.

On January 23, an official from the local government ordered the mine closed and the equipment removed from the village.

Welcome, Kirk!



International Rivers is pleased to welcome Kirk Herbertson as our Mekong Campaigner.

A human rights lawyer, Kirk comes with more than five years of experience working on environmental and human rights aspects of international development projects. Since starting the job in October 2011, our SE Asia office has

benefited greatly from the knowledge, expertise and the enthusiasm he has brought to the team, all while diligently tackling the destructive Mekong mainstream dams. When not at work, Kirk enjoys spending time in places that are either impressively beautiful or impressively narrow.

Canada Looks to Expand Hydro Exports to US

By Will Braun

Canada is a nation of wild, legendary rivers. From east to west to north, dozens of huge, storied rivers empty into the country's identity, flowing through the landscape, history and imagination of the nation.

Canada is also a nation of river-tamers. While Canadians revere their waterways, they also dam them. Canada is a "hydro superpower." Almost 60% of Canada's electricity supply comes from dams, compared to just 16% globally. Only China and Brazil squeeze more megawatts out of their rivers.

Now, Canada is embarking on a new wave of dam building. The Canadian hydropower industry plans to spend C\$55-70 billion on hydroelectric dams across the country in the next 10 to 15 years. They claim that the resulting energy – much of which will be exported to the US – will displace dirtier forms of energy and reduce continental greenhouse gas (GHG) emissions.

Yet Canadian river advocates and some energy experts are questioning the wisdom of building more environmentally damaging dams in Canada as an answer to the dirty energy problems in the US. They say a better answer to the challenges we face is more efficient use of existing energy.

According to data compiled from utility and government sources, the proposed dams will boost Canadian hydro capacity from 74,000 megawatts to about 88,500 megawatts.

Major projects in the works include the Site C dam in the west coast province of B.C., three dams in the central province of Manitoba, three projects in the eastern province of Quebec, and the Muskrat Falls dam in the eastern region of Labrador.

The projects involve significant alterations to remote rivers and in some cases also rely on existing reservoirs and diversions. The 1,100-megawatt Site C dam on the Peace River would create a reservoir 83 kilometers long and two to three times the width of the river. It would also take advantage of a 1,660-square kilometer reservoir upstream.

The three dams in northern Manitoba – designed to produce 2,380 megawatts – would flood about 50 square kilometers of land. More significantly, they all plug into an existing hydroelectric complex that involves diverting three quarters of the flow of the sizable Churchill River along a 300-kilometer diversion route. This diversion floods over 800 square kilometers of land and severely harms

aquatic and riparian ecosystems over an immense area. Much of this damage remains unaddressed.

The three projects in Quebec will create reservoirs and diversion bays covering 619 square kilometers and divert 71% of the Rupert River at a point 314 kilometers from its mouth. The projects would produce a combined 3,668 megawatts of power.

The 824-megawatt Muskrat Falls project in Labrador would flood 41 square kilometers. Indigenous people downstream of the dam are concerned about the possibility of increased mercury levels

in the water and changes to the seasonal water regime.

In all cases, project proponents insist that measures will be put in place to minimize environmental impacts. In most cases, local indigenous governments are partners in the developments, marking a major shift from the past.

Canada's hydropower boom is driven largely by the prospect of export sales. In the first two thirds of 2011, Canadian utilities exported 36.3 terawatt hours of electricity – mostly hydroelectricity – to the US (roughly equal to the output of a 7,500-megawatt dam). That number will increase dramatically if the proposed dams are built.

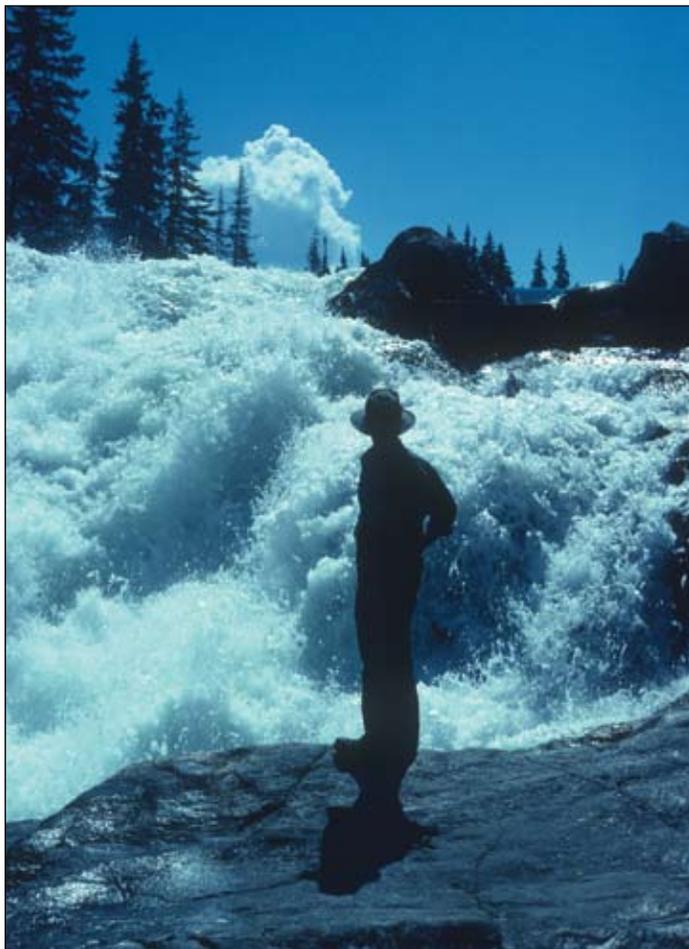
Hydropower proponents say these exports will displace carbon-intensive forms of energy in the US, where 600 coal-fired generating plants burn nearly a billion tons of coal a year. Those plants account for 45% of U.S. electricity generation. Another 24% comes from natural gas-fired plants, which are roughly half as bad as coal in terms of emissions. Alternatives are needed.

But the argument for more Canadian hydropower exports to the US becomes shakier when one examines the as-

sumptions upon which it is based: 1.) that demand for electricity will continue to grow; 2.) that the primary alternative to more hydro is more fossil fuel; 3.) that hydropower necessarily reduces GHG emissions, and 4.) that hydropower is clean.

John Bennett, who heads the Sierra Club of Canada, said, "We [Canadians] waste half the hydro we produce" and believes the "major investment" should be energy conservation and efficiency. The solution to climate change is "to use less energy," not to build mega-projects that increase supply.

Ralph Torrie, an internationally recognized energy expert, agrees that cutting North American energy consumption in half



Nistowiak Falls, Churchill River. The river has seen two-thirds of its flow diverted for hydropower. Photo: Ross Barclay

Continued opposite

is both necessary and possible. “There’s almost always a kilowatt of electricity that can be saved for a smaller cost than building a plant to generate a new kilowatt,” Torrie said. Plus, the resource gets bigger with every new innovation in efficiency. He advocates reducing energy demand through the use of more efficient means to meet virtually all the needs electricity serves.

Unlike the Canadian hydropower industry, which accepts the standard predictions that electricity consumption in Canada and the US will grow by about 1% annually in the coming decade, Torrie and Bennett do not accept the dangerous assumption of ever-increasing demand.

Nor do they accept the assumption that fossil fuels are the primary alternative to hydropower, instead of conservation and efficiency.

The third assumption supporting the argument that dams address climate change is that dams reduce GHG emissions. This belief is implied in industry assertions about hydropower displacing coal. But dams do not reduce GHG emissions per se, they increase energy supply.

Bennett insists that if dams are included in a North American response to climate change – which seems likely – they must at least be in the context of a clear, broader plan to reduce continental emissions. Then displacement could be assured. But no such bigger plan exists, Bennett said, and emissions in both Canada and the US remain above 1990 levels, the benchmark set in the Kyoto Accord.

Meanwhile, the US Energy Information Administration predicts that in the absence of policy change, the use of coal generation will continue to increase over the next 25 years as will national GHG emissions.

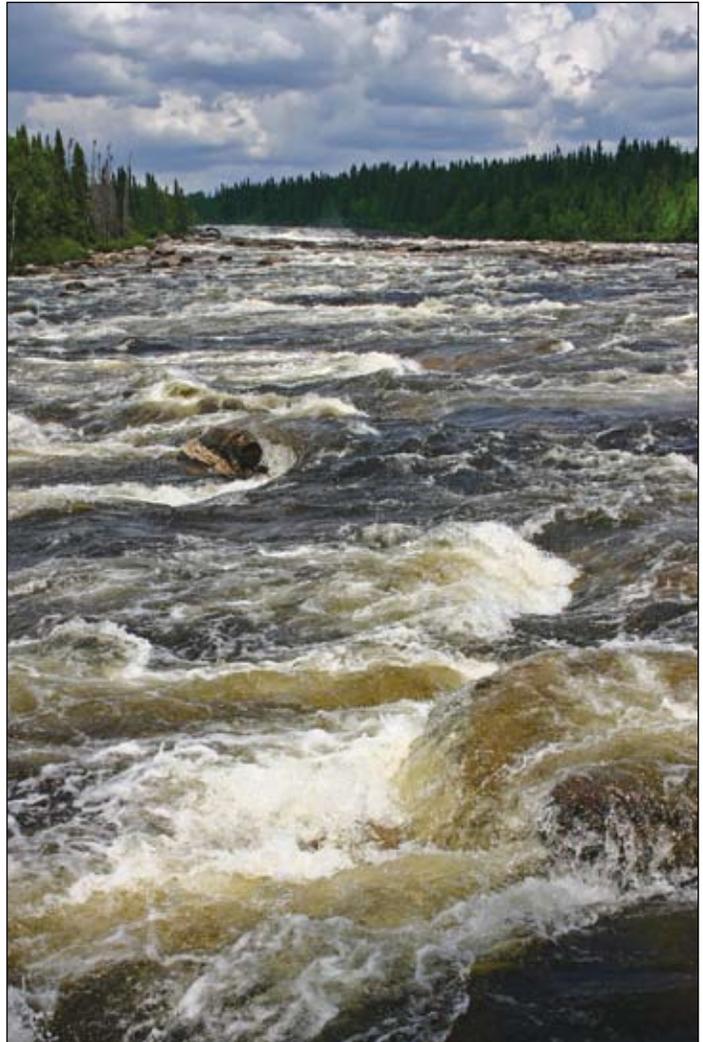
The argument that hydropower is part of the solution to climate change falls apart in the absence of any such solution. Currently, increased hydropower is simply met with increased energy demand, increased coal use, and increased global temperatures.

While utilities claim hydropower displaces coal, critics can say that every additional kilowatt of [redundant] power simply postpones the ultimate necessity of addressing inefficiency and energy addiction.

The final assumption undergirding the argument for more exports of Canadian hydropower is that hydro is clean. Jacob Irving, who heads the Canadian Hydropower Association, said, “When people refer to [hydro] as clean, it’s in the context of air emissions.” But often utilities use the term “clean” categorically, without caveat or qualification. This is misleading. Just because dams do not have carbon-spewing smokestacks does not make them clean. A dam is not an environmental improvement or favor to a watershed, as the assertions of cleanliness almost suggests.

Canadian dams permanently flood forest lands, negatively impact water quality and disturb the fragile ecological balance of highly productive riparian zones. The ecological decline they cause is ongoing and cumulative. Tony Maas, who works for the Canadian branch of the World Wildlife Fund (WWF), said the natural fluctuations in water levels are the “master variable in organizing a river ecosystem,” giving key “cues” to other species. Dams destroy the ecology of river systems by changing the volume, quality and timing of water flows downstream. The evidence of this is visible in dammed Canadian rivers, as it is in the hundreds of millions of dollars paid to mitigate and compensate for damages caused by dams. Manitoba Hydro alone has spent over C\$700 million to address damages from its “clean” hydro projects.

A 2011 report about Canada’s boreal forests by the Pew Environment Group considers both pros and cons of hydro. The re-



The Rupert River is threatened by three dams. Photo: Suzanne Levasseur

port says that although hydropower projects are “comparatively low carbon emitters in comparison to many conventional energy sources,” they cause “significant impacts to wildlife habitat, ecological processes and aboriginal communities.”

The argument for hydropower as a climate solution tends to dodge these complex trade-offs, relying rather on over-simplified assumptions. In response to one of humanity’s greatest challenges, the hydropower industry simply offers the revival of energy mega-projects first conceived of decades ago. While a case can be made for spending tens of billions of dollars to increase exports of hydropower from Canada to the US, the stronger case is for making conservation the dominant, immediate energy priority. That is the only way to ensure that Canada doesn’t become an enabler of a notoriously wasteful continent that is fiddling while the planet burns. ●

Will Braun works for the Interfaith Task Force on Northern Hydro Development in Winnipeg, Canada (<http://energyjustice.mcc.org/>). A version of this article first appeared in This Magazine.

See p.13 for news on Canada’s huge potential for geothermal energy.

A Life in Extremis

Geologist-Explorer Documents China's Rivers

Yang Yong is a renowned explorer and the director of the Hengduan Mountain Research Society, whose mission is to promote the conservation and sustainable development of a large mountain range in southwest China known for its biodiversity (including the Giant Panda) and the three major rivers that cut through the range: the Yangtze, Salween (Nu) and Mekong rivers. The group has been instrumental in increasing understanding of the biomes of western China and the impacts that development projects could have on these fragile ecosystems. Yang Yong has spoken out in the media and to the government about the seismic risks of building dams on the largely free-flowing Salween/Nu River, which is located on a number of active fault lines. Here is his personal narrative about the intersection between his life's work and love of rivers.



Yang Yong, in the wilds of Tibet.

Since I was a child, I have had a passion for discovering nature's secrets and nurtured it through exploring atlases and whatever information I could get my hands on. I went to college to study geology, where every analysis and action was performed with the goal of uncovering these secrets. No words can describe the happiness I felt from one discovery to the next, and I felt that I had finally satisfied my intellectual curiosity.

Soon after, I joined a Yangtze River rafting trip, which was almost 20 years ago. At that time, I wanted to apply my training in geology to the examination of the river's geology and geomorphology, as well as to analyze its vegetation, ecological conditions, and water quality. I wished to combine this professional endeavor with my lifelong desire to personally travel along the mighty Yangtze. It was on this trip that I found myself forging an unexpectedly close relationship with the river. In 1991, I gave up my work in a large state-owned enterprise – abandoning the opportunities to earn a living abroad – and launched a new career in the study and research of the Yangtze River. Over the years, I have traveled almost all of the rivers of the Qinghai-Tibetan Plateau. I developed a profound understanding and a strong bond with the rivers, which has since filled my life with value and meaning.

The recent unprecedented level of development along western China's rivers large and small signifies disaster for the country's ecological lifelines. This has repeatedly stirred me to action. I have raised my own funds and formulated my own research topics to embark on research expeditions along the rivers. My voyages abound with risks and hardships, and are frequently accompanied by the threat of death. Through these dangers, I have found joy

in discovery, bitterness in my plights, struggle between life and death, and the solemnity of hopelessness. But I ultimately find comfort in the fact that I have tasted all the extremes of life.

When I investigated the Jinsha River on foot, I found that historical records had indicated several occasions where mega-landslides had obstructed the river's flow. I summited to the top of where the land had begun crumbling – going from 700 meters above sea level to more than 3200 meters. In addition to obtaining first-hand information on the development of these landslides, I was astounded by the sight of millions of cubic meters of rock perilously clinging to the hill.

I realized that mining activities had heavily impact the stability of the land, posing a serious threat to the valley's villages below. I reported my warning to the relevant geology and mining administration agencies. Later, when I traveled to the Yalong, Salween (Nu) and Brahmaputra rivers, I made a similar prediction.

On one trip in 1991, a companion and I embarked along the Yalong River on foot. That day we climbed through an active landslide area at 4000 meters. In the evening we got lost in a heavy fog. Wearing thin clothes while at a high elevation and under heavy rain, we had to lie close to stay warm. Our bodies did not stop trembling, our teeth did not stop chattering, and we felt like death was imminent. I imagined people finding two intertwined corpses the next day. Several days later, consecutive days of heavy rain caused a river to surge, and its turbulent flow blocked our path. In the midst of our predicament, a few people from across the banks spotted us. They quickly carried over wood and rope – jeopardizing their lives in the rapid waters – to construct a makeshift bridge and bring us to safety. We later discovered that they were employees from the Yalong River Timber and Water Transportation Bureau, who were stranded for several days because of the continuous downpour.

In 2006, I began conducting an independent four-year assessment of the South-North Water Transfer Project, a major water diversion project to bring water from the Yangtze to the Yellow River region. Our field work lasted for more than 500 days. Volunteers and I traveled together to western China's major river systems, covering over 10,000 kilometers by vehicle and foot. We traversed snow-capped mountains, glaciers, wetlands, the Gobi desert, grasslands, forests, and glacial rivers. Our expedition felt like those undertaken by 19th century explorers.

Unlike previous voyages along the Yangtze or Yalong rivers, this series of river surveys posed more challenges because of the variations in geography and terrain. There was no backup support, and many of our destinations have rarely, if ever, been explored

Continued opposite

Big Dreams, Small (and Clever) Projects

Oliver Kopsch is a clean-energy enabler. His company, DecRen Water Consult (DWC), based in Germany, designs decentralized water systems powered by renewable energies. We talked to Oliver about his approach, and lessons learned from some recent projects.

The business model.

We are a private commercial company, based in Germany. We started about 10 years ago, after a few of us came to the conclusion that we weren't doing what we were meant to do. We started by selling solar desalination products, but we realized there were so many clever solutions for saving, purifying and supplying water in a sustainable way – but not enough good communication to those in need about the options that are ready to go, and not enough integration of solutions that can address multiple problems. So now, instead of selling products addressing only parts of a problem, we deal in advising on technologies and assisting with execution for integrated and sustainable solutions.

We help clients address all areas of renewable energy and water, such as solar pumps, appropriate water saving and irrigation systems, eco-sanitation, grey water recycling, waste water treatment and reuse, rainwater harvesting, solar desalination, and other things. We offer a one-stop solutions package, from picking technologies best suited to meet specific needs, on site installation and training to developing operations models to ensure the project is self-sustaining. Our clients are demanding professionals, such as foundations doing water projects in the global South, private clients who want to go green in a cost-efficient way, and local nonprofits working with the poor, among others. Although our scale is very grassroots and bottom up, today's clients demand solutions way beyond current practices.

Ethiopian solar water stations.

Sufficient drinking water is a huge challenge in rural Ethiopia, and reliable electricity sources are hardly available. Surface water sources are scarce and usually contaminated, and bottled water (when available) is often an expensive choice. We worked with a private foundation in Germany that was approached



DWC helped implement this solar pumping station in Ethiopia.

by Ethiopia for donations for well-digging and diesel powered pumps, the usual kind of requests. This foundation was not satisfied to just pay for the wells and then being asked later to cover for follow-up costs for repairs, fuel, etc. They were in need of a professional and sustainable response to this challenge. We helped them determine the best technologies – two

solar-powered pump and water purification stations in this case, which not only pumps and purifies clean water for local people's consumption, but also provides sufficient green power for a cell-phone charging service. Then we helped them devise a plan to ensure the project is self-sustaining without further financial or moral obligations. In this case, that meant helping to create a local nonprofit organization to operate and maintain the pumping station and receive the revenues from water and energy sales at

affordable prices. Now we have an operational agreement with this group, and the foundation gets regular reports (including financial reports) on how well the project is going. They're filling over 350 20-liter containers of water a day per well. About 15,000 villagers per well now have access to a steady, safe supply of drinking water year-round.

Because the solar filling station is doing well, it's helping create other social businesses associated with it. The group running it provides local jobs (salaries are paid for by the sale of water and solar charging). The station has also attracted a number of micro-businesses – tea and coffee sales and the like, which cater to those coming for water. And because there are no running costs, no imported fuel, all the money generated by the station stays in the region. The sense of ownership makes it a much stronger project.

The group who runs the station has been great at responding to local requests with ideas for expansion to meet other needs in the community in a service provider role. They want to build a washing station for clothes and personal hygiene next, co-funded by the revenues created locally. Not only does the foundation have no further need to support the well operation financially, it gets professional reports about its development. On top of that, the local community is more and more in the position to pay for its own development. The local and regional governments have been very supportive and are interested in the project, and hope to duplicate its success elsewhere. ●

A Life in Extremis *continued*

or investigated. We followed each river from its source to the planned section for water diversion. The expedition was exhaustively detailed as we aimed to reach the glacial source of 10 rivers, as well as five major deserts, and the borders of entire basins. Our equipment was both modern and primitive: domestically manufactured off-road jeeps, advanced photography equipment and GPS, military coats, canvas shoes, Tibetan style tents, and some brand-name outdoor products funded by friends.

After completing our journey, we returned with In abundance of data and have since endeavored to use what we've found to expand our knowledge about China's major rivers and contribute to the grassroots environmental movement. I have always advocated in our expeditions that we both respect and fear nature, and reflect on the course of human development, its impacts on nature, and our future as a species. I am grateful to everyone who has helped us along the way. ●

The Year in Review: World River News 2011

It was the best of times, it was the worst of times last year saw dams cancelled or delayed in Burma, Laos and Central America; the decommissioning of a few large dams in the US, and strong growth in true renewables in many parts of the world. But 2011 also ushered in huge dam plans in China, Turkey and Ethiopia; and saw new dams proposed or ready to start construction on too many rivers around the globe. As our friends in Mozambique say, “*A luta continua!*” The struggle continues... Herewith, the year’s high- and low-lights.



Protests stopped turbine delivery in India.

South Asia

- The Nepali government cancelled the West Seti Dam in July; the project had struggled to find funding. China has since expressed interest in building the project. Local activists have vowed to continue their campaign against the project.
- A sustained protest prevented the Lower Subansiri Dam from being completed. At least 40 organizations are working to stop the project, and have prevented its turbines from being delivered to the site. In May, the company trying to transport the turbines gave up, saying it would try another route.
- In August, International Rivers, together with four partner groups, organized the first national workshop on river basin planning in India. The three-day event led to the preparation of a civil society blueprint on river basin planning.
- Bhutan’s prime minister warned that climate change could halt the tiny kingdom’s ambitious dam plans. Himalayan glaciers are melting fast. The government wants to raise its hydropower capacity seven-fold from a current peak of about 1,500 megawatts; most of the power would be exported to India.

Global

- Global investment in clean energy generation capacity reached a record high of \$260 billion in 2011, according to Bloomberg New Energy Finance – an increase of 5% above 2010 levels and almost five times the 2004 total. A highlight was a 36% surge in total investment in solar technology, to \$136.6bn. Rooftop PV modules, whose cost has dropped by 75% in the past three years, accounted for more than half of solar’s growth.
- The Global Wind Energy Council reported a total of over 41 gigawatts of new wind power were installed in 2011, an increase of 6%. China led the way with 18GW of turbines last year; but 75 countries now have wind installations. Global capacity is now 238 gigawatts.
- China continued to hold the role as the world’s biggest dam builder. Chinese banks and companies were involved in constructing some 300 dams in 66 countries outside of China.
- The World Bank’s International Finance Corporation recognized indigenous people’s right to free, prior informed consent regarding projects in their territories. At the same time, the World Bank and other multilateral development banks revised their infrastructure strategies and reaffirmed their commitment to funding large, centralized projects such as the Grand Inga Dam on the Congo River.
- The International Hydropower Association began promoting its Hydropower Sustainability Assessment Protocol (HSAP). (See cover story.)
- Thanks to work by International Rivers and local partner groups, the UNESCO World Heritage Committee examined a number of World Heritage sites threatened by dams, including in East Africa, India, China, Costa Rica, Panama, Honduras, Bangladesh, Russia, Thailand, Tanzania, Zambia and Zimbabwe. The committee recommended a halt to the Gibe III Dam in Ethiopia, and plans to visit the site.



Rooftop solar grew leaps and bounds in 2011. Photo: Akeena Solar



In August, Burma’s Aung San Sui Kyi joined the campaign to save the Irrawaddy River from the Myitsone Dam. The government suspended the project in September. Photo: Htoo Tay Zar/OpenMyanmar Photo Project

Southeast Asia

- The Burmese president suspended the controversial Chinese-funded Myitsone Dam for five years, saying it was “the desire of the people.” The cancellation, which may signify a new openness within the Burmese government, has also been a wake-up call for China.
- In a crucial decision for the Mekong River, the Xayaburi Dam – the first of 11 proposed for the Mekong mainstream – was delayed in April due to widespread concerns over transboundary impacts and the need for further study and consultation. This decision was re-affirmed in December when the four regional governments again agreed to delay plans for the dam pending further study.

Climate

- Drought-related power outages affected Tanzania, China, Kenya, the Balkans, Vietnam, and Sri Lanka, all of which are largely dependent on hydropower for meeting their energy needs.
- The Clean Development Mechanism (CDM) Executive Board launched a policy debate on the future of the CDM. While the carbon market continues to struggle amid the financial crisis and new scandals involving fake carbon credits, the CDM Board nevertheless awarded carbon credit financing to a number of controversial projects, including two in Latin America that involve human rights violations, and two hydropower projects that had already started construction (CDM projects are supposed to be unable to go forward without the credits).
- The Green Climate Fund was created at the COP17 meeting in South Africa. Civil society is now closely monitoring it to make sure it does not include large hydropower, and that strong social and environmental safeguards guide its operation.

Latin America

- The Brazilian government has insisted on pushing forward with the Belo Monte Dam project in the Amazon. At the same time, public outcry has been growing over this destructive project. In November, 1.4 million Brazilians signed a petition against the dam. A dozen outstanding legal cases on the project's violations of domestic human rights and environmental legislation are pending in Brazil's courts.
- The Brazilian construction company Odebrecht cancelled plans for a mega-dam in Peru in November. The firm withdrew its plans to develop the Tambo-40 Dam on the Tambo River in the Peruvian Amazon. Brazilian dam builders are also reportedly shying away from other proposed dams in the Peruvian Amazon.
- Peru's government also cancelled the Inambari Dam in June. Thousands of local people had protested for months, calling for a cancellation of the dam and mining concessions in their territory. The project, proposed for the Amazon basin 300 km from the border with Brazil, would be built by a Brazilian company.
- The Honduran Congress approved a contract with China's SinoHydro to build the first of three dams on the Patuca River. Local activists are calling for proper environmental studies and for the right of indigenous peoples to Free, Prior, and Informed Consent before any projects are built in their territories.
- The EIA for Patagonia's HydroAysen dam project was approved. The decision sparked huge protests all over Chile – the biggest protests there since the end of the Pinochet dictatorship.



Indigenous people protested Brazilian President Dilma Rousseff's support of Belo Monte Dam last year. Photo: Evaristo SA/AFP/Getty Images

Africa

- Amid turmoil in Egypt, which has long held rights to most of the waters of the Nile, the Ethiopian government announced it intends to build Africa's biggest dam, the Grand Ethiopian Renaissance Dam, on the Nile.
- Kenyan activists protested China's involvement in Gibe 3 Dam, being built by Ethiopia on the Omo River. The World Heritage Committee urged Ethiopia to halt to the project, which will harm the Omo Valley and Lake Turkana.
- A long-running protest by people displaced by Merowe Dam on the Nile in Sudan spread to the capital of Khartoum, where it was met with repression from government forces. The Chinese-built dam was completed in 2009.
- Sudan contracted SinoHydro to build Kajbar Dam on the Nile in Sudan.
- The governments of South Africa and the DR Congo signed an agreement to develop Grand Inga, Africa's largest dam. The African Development Bank began a feasibility study for the project. The project is expected to cost at least \$80 billion.
- Kenya announced it intends to get half of its electricity from geothermal power by 2018, to cushion against the growing uncertainty of hydropower.

China

- A new dam-building spree for China's major rivers was outlined in the 12th Five Year Plan. The added capacity is equivalent to building a new Three Gorges Dam every year for the next five years. The Nu/Salween River is a potential hydro hotspot, but the river's fate is still undecided thanks to efforts by local experts to show that dam building in this seismically active region requires further study.
- SinoHydro, the world's largest dam builder, made significant progress in adopting the first-ever environmental policy for its overseas operations. The company said it plans to publish the policy soon. SinoHydro also launched its IPO on the Shanghai stock exchange, amid increasing scrutiny by the Chinese media on China's environmental footprint overseas.
- China's highest government body for the first time officially acknowledged the "urgent problems" of the Three Gorges Dam, particularly when it comes to ecosystem impacts, bank erosion and massive landslides in the reservoir, water pollution and algal booms, and the welfare of relocated communities. Government officials have admitted to these problems in the past, but the statement from the State Council carries more weight.



Removal of the Elwha Dam began in Washington state. Photo: National Park Service

Dam Removal

- Deconstruction of two dams on the Elwha River in Washington State got underway, after a long campaign to decommission them. The dam removal is one of the largest in the US, and will open up river habitat to endangered salmon and other species.
- On the White Salmon River in Washington state, another big dam removal began last year. The removal of Condit Dam will restore 33 miles of habitat.
- Removal began of two dams on Maine's Penobscot, New England's largest river.

Grand Inga : Will Africa's Mega-dam Have Mega Impacts?

By Kate Showers

*Central Africa's Congo River holds more hydropower potential than any other African river, and the Grand Inga Dam is a grandiose proposal to tap it. Project proponents predict electricity generation more than twice that of China's Three Gorges. In November, the South African and DR Congo governments signed an agreement to develop the dam. But its outsized price tag (estimated at \$80bn) presents a huge roadblock. In February, the \$5.2 billion Inga III Dam, also proposed for the Congo, lost its main sponsor in part over project costs; it is now in limbo. Here we excerpt a chapter from the book **Engineering Earth** (Springer, 2011), which raises concerns about Grand Inga's environmental impacts, and the potential consequences of its grand scale.*

Africa is a mega-continent; it accounts for 20% of the earth's surface. Its land area is greater than that of China, Europe and the US combined. The Congo River, which empties into the equatorial Atlantic Ocean, is the world's second largest by flow, after the Amazon. In 1921 the continent was identified as possessing one half of the world's hydroelectric power potential, with the Congo River basin containing one quarter of it.

What makes the Congo unique among the world's great rivers is the presence of significant rapids and waterfalls so close to its mouth. The Lower Congo narrows sharply and descends over a series of rapids known as Livingstone Falls. As the river drops to sea level, the channel narrows further and its course makes a sharp 180-degree bend. This is Inga Falls, and it is this unique geomorphic feature that provides the Congo's greatest hydro-potential – the world's largest in terms of flow rate. Engineers envision adjacent valleys as hypotenuses in which electricity generators could be installed and through which the already confined Congo could be diverted before returning to its bed below the falls. This is Grand Inga.

Designs for the Grand Inga Dam have called for a 205m (673 ft) dam wall that will produce a 15 km long reservoir. There are no published estimates of reservoir storage capacity or volume. The Secretary General of the World Energy Council, Gerald Ducet, a major promoter of the project, said the dam would be “substantial, but not among the world's highest” and “the 15 km long reservoir pales into insignificance in comparison with the Three Gorges Dam in China and the Volta River scheme in Ghana.” While the dam wall would not be the highest on earth, it would exceed the continent's highest dam wall, Lesotho's Katse at 185 m, by 20 m. The proposed Grand Inga dam wall would certainly be a mega structure. Because the Congo's flow regime does not have large seasonal variation, a “run-of-river” design was used. (Run-of-river usually means a small dam but not always, and the impacts of such projects can be quite large.)

Grand Inga's power has never been considered for rural electrification and domestic use. It has only ever been intended for areas of high commercial demand – large cities and industrial areas – and for production of an export commodity. The historical problem of markets for Grand Inga's electricity was solved by High Voltage Long-Distance (HVDC) transmission technology, regional power pools and a proposed continental grid. By the early 1990s, HVDC lines could transmit electricity for about 6,500 km, and HVAC (High-Voltage Alternating Current) lines for 4,800 km. Grand Inga's electricity would be transmitted for very long distances to distant consumers along “export corridors” or “electricity highways.”

Unintended Consequences

Supporters of the project have long argued that social and environmental consequences would be slight for such a large output

of electricity. The land around Inga Falls was believed not to have substantial human settlements, and a large impoundment was not imagined. Criticism, largely from the NGO community, raised concerns not only about displaced people, but also about threats to biological diversity posed by the reservoir and unidentified consequences for aquatic ecosystems up- and downstream of the dam.

Environmental reality destroyed an 80-year-old dream of a dam across the Congo. When engineers from WESTCOR – the consortium created by the electricity utilities of Angola, Botswana, Democratic Republic of Congo, Namibia and South Africa – diverted their attention from electrical and construction challenges to actually look at topographical maps, they realized that the original Grand Inga dam design would inundate all low-lying areas in the catchment, creating a massive lake that would flood two major cities: Kinshasa and Brazzaville about 260 km upstream. In addition, the river contained so much sediment that simple calculations showed that the dam would become “packed.” Finally, as the dam reduced the Congo's flow, salt water from the ocean would intrude upstream for 50 km causing “irreversible environmental harm to all living matter and organisms at the river mouth.”

Sobered by this “common sense appraisal,” the engineers concluded that “much of the river must flow as naturally as possible, keeping the impact on the environment to an absolute zero.” Instead of one Grand Inga Dam, they proposed “storage for those times when the river flow is much higher than normal constant flow” and “develop[ing] the concept of Grand Inga Cascades.” Grand Inga Cascades would use the same water several times before returning it to the river. Chief Engineer and CEO of Westcor, Pat Naidoo, asserted that “with sound engineering, much more output can be extracted with no impact on the environment.”

Unrecognized and therefore undiscussed are the unique and important linkages between the Congo River and the equatorial Atlantic Ocean, and their relationships to global carbon and water cycles. The Congo River influences both surface and the deep-sea waters more than 700 km from its mouth. Design drafts of the new Grand Inga project have not been published, so the extent of river disruption is impossible to gauge. But any disruption of flow will certainly have consequences far out to sea, and perhaps, of global importance.

Relations between the Congo and its very large estuary (145 km long, 10 km wide at its mouth) conform to textbook descriptions of river function and conventional arguments against dams. Proponents countered that the absence of large human populations, a delta, and distinct seasonal flow regimes – as well as a run-of-river design – removed most concerns. Overlooked is the fact that the Congo actually has a very active delta – it is simply submerged far out to sea. An enormous submarine canyon beginning 30 km upstream in the estuary continues 730 km into the Atlantic Ocean, ending in a 300,000 km² fan on the deep ocean floor. The Congo

Continued opposite

Canyon descends to approximately 5,000 m. The fan has channels that have been traced for 900 km.

This enormous, complex and little-understood geomorphic feature is unique in that it provides a direct – and active – link between terrestrial ecosystems and the deep sea as solid organic material is transferred from the river and estuary out through the canyon towards the delta. Effects of the river's substantial sediment loads have long been noted. Shipping lanes have required constant dredging, and the turbines of existing Inga I

and II dams have been damaged by it. In 2001, research equipment at a depth of 4,000 m collected samples showing massive transmission of sediments and organic matter in a “cloud of particles” for several days, distributed over 13 km² of ocean floor outside the canyon. The event demonstrated that “terrestrial carbon in turbid underflows cannot be neglected in the carbon budget of the whole Congo-Angola margin.” The source of this essential carbon is the Congo River and its estuary. Biological activity associated with “abundant tree leaves and rich fauna” was noted in a trawl 150 miles off the coast at a depth of 2,200 fathoms, and anomalies in the deep ocean thought to signify biological activity have been measured over an unexpectedly large area.

On the surface, Congo River water extends into the Atlantic Ocean in an ever-widening plume that has been measured seasonally 800 km offshore. Its biological activity is clearly visible in satellite imagery. Phytoplankton growth – and death – is central to global carbon balances. Carbon sequestration occurs when phytoplankton die and sink to the ocean floor, where they remain undisturbed. The function of the equatorial Atlantic is crucial in all calculations of global carbon budgets and, thus, climate function and change. Since the plume of the world's largest river, the Amazon, which also empties into the equatorial Atlantic, is pushed northward into the Caribbean Sea by ocean currents, the significance of the Congo plume should not be underestimated.

In the context of growing awareness of the importance of the Congo for large-scale surface and deep Atlantic Ocean processes, plans to divert, store or otherwise intervene in Lower Congo River dynamics are truly alarming. Engineers and dam opponents agree that, whether mega or not, structures in rivers trap suspended material and release “sediment-starved water.” Reducing the Congo's sediment will decrease its estuary and the river plume's phosphorus and iron contents, as well as some organic matter. Could lower levels of phosphorus and iron affect biological production of the Congo plume? Could this affect the ability of the Atlantic Ocean to be a carbon sink?

The Congo River water deprived of its descent over rapids will be an oxygen-poor river, and a river deprived of its “higher than normal constant flow” would have a reduced plume with a reduced, rather than enriched, oxygen content. What would the associated loss of oxygen mean for estuary and ocean biogeochemical processes? Could oxygen deprivation reduce productivity or create a “dead zone” – in which waters are so depleted of oxygen that they can no longer support marine life?

Finally, how would any proposed reduction or alteration of the Congo's flow – such as storing “higher than normal constant flow” – affect the transmission of terrestrial sediments to the deep ocean? Could the mechanisms of transporting turbidity events in the submarine canyon be affected in any way by changes in the Congo River's properties or flow regime? These questions must be answered.



The Congo River. Photo: Greenpeace

Beyond Mega

The twentieth century saw a rapid rise in technology's ability to affect larger areas over longer distances, as well as the number of bio-geo-chemical systems simultaneously. With each increase in dimension came an increase in complexity in terms of interactions between human beings and the environment. In popular parlance, mega was a term that expressed the idea of larger-than-large, larger than local, a size almost beyond human ability to imagine. In 1939, the American Hoover Dam on the Colorado River was the world's largest, creating a 640km² reser-

voir behind its 221 m high wall. At that time the dictionary definition of mega was one million times greater than expected – almost unimaginably enormous; ten times the size of large seemed a more manageable definition. No one had flown to the moon. The 1959 closure of Kariba Dam created the largest man-made lake in the world, with a surface area of 5,200 km², and volume of 188,000 million m³. Mega was a mid-century term to describe a scale larger than normal, larger than large, larger than local.

This meaning quickly proved inadequate on the African continent, where dams proliferated, ever-larger structures were built, and reservoirs exceeded 100 times mega. To follow mathematical logics, it might be appropriate to introduce the term “giga,” which means 1000 million in American English, when discussing reservoirs. This is already used for the vast increase in electricity generation capacities that exceed the convention of megawatts (MW). A gigawatt is 1,000 megawatts, so Grand Inga's estimated 39,000 MW reduces to a more manageable 39 GW. What would constitute a giga-reservoir? A thousand times a mega defined by volume? Length? Surface area?

Introducing the idea of a “giga” dam – or any other term to describe increases in physicality – neatly avoids the question of significance. What is the true meaning of these size increases, beyond the excitement of engineering achievements? With each increased dimension, more systems are disrupted, if not obliterated. Interconnected biological, hydrological, geological, and chemical systems and cycles interact locally, regionally and even globally, creating a planet conducive to human life. As human capacity to intervene has increased spatially and temporally, humans have separated themselves from other organisms that manipulate and co-create the environment in which they live. Humans have gained the ability to obliterate entire ecosystems over very large expanses, and to set in motion sequences of events with very longterm consequences, and in distant locations – seemingly without noticing, and certainly without accepting responsibility. What phrase can be used to describe such interventions?

And how can they be analyzed? In mid-twentieth century simplicity, the idea of an environmental impact assessment of a landscape intervention seemed a radical challenge to technological prowess. Battles were fought to save or protect species, and from this the idea of environmental conservation was reduced to a series of checklists. Once the list of endangered species was agreed upon, all that remained was to protect them – or a shred of habitat for a minimal population's survival. The idea of protecting entire ecosystems and ecosystem function receded until reclaimed by environmental economists' ideas of valuing identified “environmental services” – and protecting them. Once again, the environment was reduced to a checklist.

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News Briefs

by Kate Ross



Discarded orange peels and other crop waste can be used to make electricity.

Biofuels with appeal

Could electricity someday come from fruits and nuts? Recent developments show potential for using food waste to create biogas.

A University of York scientist has developed a technique that uses high-powered microwaves to capture gas from orange peels, which can then be turned into biofuel. The project is now in the demonstration phase, but has already piqued the interest of two of the world's largest fruit industries, Spain and Brazil. In 2011, Brazil produced 15 million tons of oranges; about 86% of those were turned into juice, which created roughly three million tons of orange peel waste.

Scientist James Clark sees this waste as “economically and socially unacceptable, as well as representing a major loss of resource,” and is working on a solution through his new orange peel technology. Other agricultural cast-offs such as cashew shells, coffee grounds, apple peelings and rice husks can be used in similar fashion.

In related news, UNDP scientists recently reported that mango pits and coconut shells have especially high potential to generate biogas electricity, especially in poorer regions of the world.

Many poor, rural areas that lack electricity do have plenty of coconut shells and discarded fruit pits. University of Kentucky plant scientist Seth DeBolt says a coconut shell or mango pit “compares roughly to low- to moderate-grade coal in its heating value, which is excellent.”

DeBolt says a company in India called Husk Power is using small generators in local villages to turn rice hulls into electricity. Using a process called gasification, the plant matter is heated in a low-oxygen chamber, which releases gases that can be burned in an engine that spins a power-generating turbine.

In a new study in the Proceedings of the National Academy of Sciences, DeBolt and his colleagues found enormous potential for using coconut, mango and other fruit seeds in gas generators. In a country like Indonesia, for example, these systems could provide as much as 13% of national energy needs.

Malaysian indigenous join to stop dams

Representatives from affected communities in Sarawak, Malaysia in February kicked off a campaign to stop 12 planned dams in Sarawak.

Some 150 indigenous representatives from areas already affected or to be affected by dam projects came together to share their experiences at a conference organized by the newly founded SAVE Rivers Network. The conference revealed that Sarawak's previous construction of dams has violated international human rights and environmental standards, as well as basic rights guaranteed under the Malaysian constitution.

The Sarawak state government, along with Chinese investors, plans to construct 12 more dams to provide 28,000 MW of electricity to create an industrial complex in Sarawak's remote jungles.

The leaders issued a joint statement demanding an immediate stop to all dam projects, respect for the right to consultation and a public discussion around these large-scale projects. Peter Kallang, chairperson of the SAVE Rivers Network, said the conference is just the beginning of a long struggle. “We are planning a road show in Baram where we will visit all affected communities. The goal is to create committees in all affected areas which in turn will become the organizational base for collective action against these mega-dams.”

People representing the areas where dams have already been built described how involuntary resettlement left them more impoverished than before. One participant from Bakun said, “The government made so many promises to us concerning free houses, free electricity, and free water. All these are just empty promises. We are still waiting for their implementation.”

EU breaks record for renewables

Europe reached record growth in clean energy last year, with 70% of its new generating capacity coming from renewable sources. According to a report by the European Wind Energy Association (EWEA), 32,043 MW out of a total 44,939 MW of new capacity in Europe now comes from renewable energy technologies – an increase of nearly 38% over 2010. Solar power is responsible for nearly half the growth. The rise in solar was most evident in Italy, which became the world's biggest solar PV market in 2011.

Solar power is expected to reach “grid parity” (e.g., cost the same or less than conventional power sources) in Germany by 2013, three years ahead of schedule.

India solar soars

Solar projects have seen an unprecedented growth in India over the last year. Experts say India will exceed its goal to produce 20,000 megawatts of solar energy by 2020. India is the third biggest energy user behind China and the US. The country gets up to 300 days of sunshine a year. The cost of solar energy in India has declined 28% since 2010, according to Bloomberg New Energy Finance. Massive expansion of panel production in China caused the global price of solar panels to plummet 30-40% last year.

India now joins a few other places such as Italy, Spain and Hawaii where rising fuel costs and lower solar panel prices make solar pay for itself without state subsidies. Leading companies are now producing power from solar cells more cheaply than burning diesel, including Mittals Bharti Airtel Lts, India's largest mobile-phone operator, and Jain Irrigation Systems Ltd, the world's largest mango-puree producer.

Bhutan alarmed by climate change

Bhutan's prime minister has warned that the impact of climate change on Himalayan glaciers could wreck the tiny kingdom's ambitious plans to be a world leader in hydropower, and harm its hydropower-dependent energy sector.

Bhutan has said it intends to raise capacity seven-fold by 2020, by building 10 new dams. This would raise peak capacity from about 1,500 megawatts (MW) to 10,000 MW. Most of the electricity would be sold to neighbor India. The nation has an estimated potential of 30,000 MW of hydropower. It also has about excellent wind potential, and an estimated 3,000MW of solar power potential, according to a US government study. Donor projects are underway to start to tap these renewables.

Prime Minister Jigmi Thinley told AFP, "The glaciers are retreating very rapidly, some are even disappearing. The flow of water in our river system is fluctuating in ways that are very worrying."

"In the summer they overflow their banks in a way that used to never happen in the past and in the winter they shrivel and almost dry up. The climate is changing, global warming is real and the impact on our hydrology is very severe."

The melting glaciers have also led to the creation of glacial lakes that threaten people in the valleys below. The government is building an early warning system to alert authorities to breaches in the natural dams.

"Hydropower may not be the sort of exponential source that we considered it to be," the prime minister said.

The Himalayan mountains are a source of water for 1.3 billion people living downstream.

Canada's vast geothermal potential

A "massive" store of clean, renewable geothermal energy is waiting to be tapped in Canada, according to a new government report. The steamy deposits of hot rocks could produce more power than the country now consumes.

"As few as 100 projects could meet Canada's energy needs," according to the team's findings.

The report, led by the federal Geological Survey of Canada, suggests the clean, renewable source of energy could be a game-changer.

"Canada's in-place geothermal power exceeds one million times Canada's current electri-

cal consumption," the report says.

The heat is closest to the surface in large swaths of British Columbia, Alberta, the Yukon and Northwest Territories, but the report says geothermal energy opportunities exist across Canada.

"Of anywhere in the world, Canada has the technology and knowledge to move this forward," Stephen Grasby, the report's lead scientist, told the *Montreal Gazette*.

Geothermal is not only clean energy, but it is constantly available, and not subject to the kinds of hydrological risk that climate change is bringing to hydropower dams.

The biggest downside to geothermal energy is relatively high upfront costs. Wells must be drilled miles deep to bring the heat to the surface and plants must be built to turn the heat into electricity. It takes five to seven years to get a geothermal energy system operating, according to Alexander Richter, director of the Canadian Geothermal Energy Association.

Canada has yet to tap its geothermal reserves. The nation is the second largest producer of hydropower, after China. (See story, page 4, on Canada's intent to dam its rivers for exporting electricity to the US.)

Brazilian megadam applies for carbon credits

Scientists in Brazil have clearly demonstrated that hydropower projects in the tropics can lead to an increase in greenhouse gas emissions through the degassing of methane and carbon dioxide from man-made reservoirs.

It thus comes as a shock to civil society and reservoir emissions experts that the developers of one of Brazil's largest planned dams, the 1,800MW Teles Pires project on the Teles Pires River (a tributary that feeds into the Tapajós, one of the biggest tributaries of the Amazon River), have applied for carbon credits from the Clean Development Mechanism (CDM). The CDM is meant to catalyze climate friendly technology while reducing global emissions and promoting sustainable development.

Despite the current knowledge about tropical reservoirs' potential to be heavy greenhouse-gas emitters, the project's CDM application claims the project will generate emissions-free electricity. The application also ignores the project's cumulative impacts with four other large hydropower projects planned for the Teles Pires River. The dam cascade is also linked to the opening of an industrial waterway aimed at increasing exports of soybeans from the large-scale mechanized agribusinesses now sprouting in the frontier areas of Northern Mato Grosso state. These agribusinesses are leading to further clearing of the *cerrado* (tropical savannah) and Amazon forest, which play a key role in carbon storage and regulation of the global climate system.

Another grave concern is the project's impacts on local indigenous tribes. In a December 2011 letter from the Kayabi, Apicás and Mundurucu tribes to the Brazilian government, indigenous leaders stated that the environmental licensing process of the Teles Pires Dam failed to follow international standards on free, prior and informed consent of indigenous communities. According to the letter: "The Sete Quedas rapids, which would be flooded by the dam, is the place where fish that are very important to us go to spawn, such as the pintado, pacu, pirarara and matrinchã. This hydroproject... would eliminate the fish that are the basis of our sustenance. In addition, Sete Quedas is a sacred place for us, where the *Mãe dos Peixes* ("Mother of Fish") and other spirits of our ancestors live – a place that should not be messed with."

International Rivers and our partners are actively monitoring this project's CDM application and will warn any potential credit buyers of its problems.

Katy Yan

BHP pulls out of Congo dam

Australian mining giant BHP Billiton announced in February it would abandon plans for an aluminum smelter in the Democratic Republic of Congo, which is a major setback for the planned Inga III Dam.

The Inga project, estimated to cost \$8-\$10 billion, has been stalled for several years. Recently, the African Development Bank has begun warning over the dam's cost, while advocating for the much bigger Grand Inga project (see story, page 10).

French Dam Removal Opens Way for Atlantic Salmon

By Guo Xin

The Allier, main tributary of the river Loire, is among the last wild rivers in Europe. The river and its watershed shelter extraordinary fauna and flora due to the geologic complexity of the mountainous Massif-Central through which it flows.

An indispensable part of the river's treasure includes wild Atlantic salmon, a unique symbol and store of genetic diversity that will provide a base from which to restore diminishing salmon runs in other major rivers of Western Europe. In the 20th century, Atlantic salmon suffered a tragic decline, starting with the construction of Saint-Etienne du Vigan Dam (built in 1895, dismantled in 1998) and accelerated by the Poutès Dam in 1941. According to the French river activist group SOS Loire Vivant, the Poutès Dam, whose construction was driven by excessive energy demand stemming from World War II, is responsible for 90% of the loss of Atlantic salmon in the Loire region.

Decades-long Campaign

Fishermen along the Allier geared up an anti-dam campaign from the end of the war. It was not until 1986, however, that the first environmentally conscious initiative was undertaken by the dam's owner and builder, Electricité de France (EDF). They equipped the dam with a fish passage structure designed to allow the salmon to migrate upstream.

Only around 10% of the precious salmon passed through the elevator, however. In recent years, the government, EDF and civil society came together at the same table to discuss how to set the river free.

Dismantling the two dams on the upper Loire was deemed the priority for restoring the Atlantic salmon runs in France. After the ambitious "Plan Loire Grandeur Nature" was launched by the French government, a powerful explosion in 1998 marked the nation's first effort to re-open one of the largest spawning grounds for Atlantic salmon. It was indeed *"un rayon de soleil"* (a beam of sunshine) for river activists. Over several years, the NGOs allied with both fisheries associations and institutes in a common goal of saving salmon species: brochures, round tables, exchanges with the European Union as well as national leaders paved the route forward for restoring the Allier as well. A petition was launched by WWF France and Nature & Découvertes in 2004. "10 good reasons for Poutès Dam Removal" were communicated to the public in a sincere and amiable way. After this petition, WWF engaged in a research effort entitled "Tomorrow's Energy," a plan that envisaged alternative energy sources to replace the dam's production.

Innovative Solutions for Mutual Benefit

EDF at first was hesitant, and made an unsatisfying proposal in April 2011 to replace the dam with a 3-5 meters high permanent dam. This proposal was immediately rejected by the NGOs. EDF soon realized, however, that it was at risk of having the renewal application for its operating license rejected. Eventually, the

company compromised – agreeing in October 2011 to decommission the dam and build a replacement barrier of 0-4 meters. The barrier can be removed, and will significantly reduce the area of the reservoir: instead of 3700 meters (a size that is a major threat for salmon lifecycle), the length of the new reservoir will be 350 meters. The project cost approximately 10 millions euros.

The marvelous news was welcomed by NGOs, fishermen, scientists and elected officials who had campaigned for 20 years to remove the Poutès. Nathalie Kosciusko Morizet, Minister of Ecology and Sustainable Development, announced the formal dismantlement of the dam. The activists were in the mood to pop open the champagne themselves; they gathered riverside to share the victory with the Allier and its precious inhabitants.



The Poutès Dam has devastated salmon runs.

A Successful French Model of NGO Mobilization

Although it has been a long, winding road, the French NGOs remain strategic, cooperative and mobilized in the campaign. The activists attracted the Allier fishermen as their first partners in the campaign to protect Atlantic salmon. Most significantly, the activists proposed thriving projects of tourism and renewable energy along the valley that compensates the loss of Poutès electricity production. The projects coincide with government initiatives.

The next challenge facing the French NGOs is to improve the water quality in the Allier/Loire region. It is up to the salmon to once again repopulate the river once the dam is down. Drawings of salmon were found on cave drawings in France that date to 25,000 years ago. French activists are working hard to ensure this iconic species will not disappear. ●

The author holds a master's degree in NGO Management in EDHEC France and has been volunteering for International River from Paris for two years.

The hollowness of the list approach is frighteningly evident when larger-than-mega projects are considered. Clearly the world's second largest river by flow is not only deeply involved with the function of its terrestrial drainage basin (watershed), but less obviously fundamentally important to the Atlantic Ocean into which it empties. What name could be given to a project that requires an impact analysis ranging from terrestrial flora and fauna (including humans) to the deep ocean floor and the global carbon cycle? Who could carry out such an investigation, and who would be able to read and comprehend such a report? Do we dare ignore the linkages because they are too complex and difficult to understand? The scale of possible consequences suggests that we cannot. Argument has been made in the past that sacrificing a local ecosystem could be justified for some "greater good" defined by an economic analysis. But how can one make such an argument when what is potentially sacrificed are elements vital to the balancing of planetary systems?

Greenwashing *continued from page 1*

based on an inherent conflict of interest; the dam industry created and controls the use of this tool. Most HSAP project assessors come from the hydropower industry itself. HSAP's lack of rigor and conflict of interest merely adds to the impression that big hydro is a corrupt industry unwilling to subject itself to outside criticism.

HSAP assessments will always tend to be partial to industry interests. For example, HSAP assessors are not required to engage with project-affected communities. Meanwhile, participation of civil society in the scoring of the assessment, or in the creation of the assessment itself, is neither guaranteed nor safeguarded. Rather, civil society is given a 60-day consultation period once an HSAP assessment is made public, which occurs when the developer decides to publish it on IHA's HSAP website.

Any published project can be granted a label of "sustainable hydropower" by IHA – regardless of the assessment score. In other words, HSAP does not require developers to do anything but self-assess their projects. A blatant example of the self-promotional aspect of HSAP is that dam builders can purchase the title of "Sustainability Partner" by paying \$65,000 to the IHA and committing to utilize HSAP on their projects.

The clearest example of the danger of the HSAP greenwash is in Ethiopia. The Ethiopian government has used harsh tactics to silence critics of its Gibe III and Grand Millennium dam projects. Social and environmental impacts have been ignored. Even very large, destructive dams have begun construction without any studies into their impacts. Yet, the International Hydropower Association granted Ethiopia's national utility the status of "Sustainability Partner" in April 2011.

Another example comes from India. The National Hydropower Company of India (NHPC) used a trial version of the HSAP on the Teesta V Dam in 2010. The dam had been completed for three years, yet social and environmental problems remain unresolved. According to evidence gathered by local groups, project mitigation and compensation efforts had fallen well short of "best practice." Faulty infrastructure marked affected communities' resettlement areas; monetary compensation for land had not been paid; and relocated communities were never given access to educational services, among other violations. Yet the trial HSAP scores for the dam's operational stage were at the highest levels – signaling that NHPC followed "best practices," and that Teesta V was a "sustainable dam."

Civil Society Pushes Back

The HSAP process never had any real buy-in from civil society. The only civil society organizations to support the HSAP are The Nature

Grand Inga is far beyond the scale of a mega project. It exists in a realm of human escapism, in which technology allows postponement of accepting – and addressing – consequences of lifeways and logics of economics, the ultimate social construction. Perhaps it could be said that it resides in the "hubrisphere" and belongs to the category of "hubris" projects, those which require far more than local funding, materials and expertise for implementation and which have consequences that are extensive in space and time, and particularly those affecting boundaries between, or interactions among, atmospheric, aquatic and terrestrial systems and spaces. Hubris projects already exist; Grand Inga shows that there are no limits to our ever-more-hubristic engineering imagination. ●

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Conservancy, Transparency International, and the World Wildlife Fund for Nature (WWF). WWF long ago decided to partner with corporations to create "sustainable" commodity chains, and the HSAP is the latest example of WWF's efforts. Meanwhile, civil society organizations, indigenous people and dam-affected peoples' movements of the Global South – where most new dams are being built – were never consulted by IHA. The good news is that in response to HSAP, international civil society and dam-affected peoples' movements are developing a rights-based guide to the highest social and environmental standards developed for hydropower projects. The guide will build the capacity of civil society organizations and dam-affected people to hold dam builders and financiers accountable, to analyze projects based on the best standards, and to reveal when destructive dams are merely being greenwashed. Where governments do not adhere to these standards, civil society may leverage the guide to promote legislative reform at home. The guide is set to launch in June 2012.

Standards Cannot Be Set by Corporations

The World Water Forum 6 in Marseille will kick off a series of meetings and reports by the world's governments and corporations regarding the future of the world's water. Following the World Water Forum, the dam industry will reconvene in June at the Rio+20 meeting in Brazil, where it is expected that dams will again be promoted as a solution to poverty and climate change, and a stimulus to economic growth. The HSAP's approach provides a lesson to the future of water, energy, and the hydropower sector. Corporations must be held accountable to the highest binding standards, the rule of law, and public and civil society oversight. Without these, any voluntary self-policing initiative is bound to lead to corruption and a lack of implementation.

This is especially significant in today's financial environment. Many middle-income countries, such as China, Brazil, and India, are increasingly able to finance their own dams. Yet many middle-income countries are loath to endorse international norms, or adhere to international standards in their national legislation. In these cases especially, it is dangerous to allow dam builders to police themselves using voluntary tools.

The real challenge for the World Water Forum 6 – and for Rio+20 – will be to ensure that governments create meaningful, binding laws that safeguard the social and environmental rights of people affected by the dam industry. Allowing developers to simply greenwash dams as "sustainable" with no benchmark in national laws, no buy-in from civil society, and no mechanism for true accountability – as the HSAP allows – is a step in the wrong direction. ●

International Rivers fights dam greenwashing at Water Forum

Here's a summary of International Rivers-sponsored events the World Water Forum in Marseille:

- March 14 (the International Day of Action for Rivers): We join civil society colleagues from around the world in a vivid protest against the HSAP and the greenwashing of dams.
- March 15: Zachary Hurwitz will give a talk at a side event of the World Water Forum 6 on "Water and the Green Economy."
- March 16: With civil society colleagues, we will hold panel sessions on "Water and Hydropower" at the Alternative Water Forum.

Follow Zach's blogs from the Forum:
<http://tinyurl.com/88x9ztk>

A Current of Hope Runs Through Patagonia

By Berklee Lowrey-Evans

Although things have quieted down in Chile since the HidroAysén dams' EIA was approved last May, the five large dams on the Baker and Pascua rivers in Patagonia are far from a done deal.

Sustained protests against HidroAysén around the country in the middle of last year inspired the well-publicized student protests that have been ongoing since then. These two movements together have created the biggest social unrest in Chile since the fall of the dictatorship of General Pinochet in 1990, and mark the beginning to the first widespread environmental movement in the country.

Shortly after the EIA approval, the Consejo de Defensa de la Patagonia (CDP, or Patagonia Defense Council) went to court. The case has moved up to the Supreme Court, where arguments were heard on December 23; a ruling is likely to be handed down by April.

In early December, HidroAysén publicly released a portion of the proposed route for the transmission line. They spent the next two weeks meeting with residents in Cochrane and Chaitén to discuss the expected impacts, and likely to also discuss plans to buy property or compensate landowners. The transmission line is now planned to run underwater for 160km of the 1,912 km length of the line, from the mouth of the Río Yelcho near Chaitén north to Puerto Montt. The line would no longer cut through Parque Pumalín (a nature sanctuary), which has been a contentious issue for many years.

A few months ago, HidroAysén again delayed submitting the EIA for the transmission line; they now expect to submit it in June. While they claim the approval process will take two years, it is likely to take significantly longer since it would affect thousands of people and run through about half the country. The EIA for the dams took over three years to gain approval.

President Piñera's approval rating has continued to drop – and is now lower than any other president in Chile since democracy was restored in 1990. On January 12, Piñera outlined a new energy plan that isn't likely to improve his standing: the plan decreased the nation's targets for energy efficiency, and stated strong support for hydroelectricity, especially in the Aysén region of Patagonia.

For the time being, things are quiet in Chile, as most people take vacation in February. The middle of this year should provide another round of excitement, with the upcoming Supreme Court ruling and the submission of the EIA for the transmission line. Chileans may take to the streets again, with their creative protests, banging on pots and pans, holding up candles for moments of silence, and flooding the streets of the capital and cities throughout the country to show their support for a *Patagonia Sin Represas* (Patagonia Without Dams). ●

Follow the campaign – read Berklee's blog: <http://tinyurl.com/7aspuh7>