

WORLD RIVERS REVIEW

INSIDE

Commentary

A farewell message from editor Lori Pottinger
Page 2

Human Rights

A roundup of indigenous peoples' struggles to defend their rivers, and lessons learned. Pages 4-5

Climate Change

Challenges regarding rivers and dams in a warming world. Pages 6-7

Looking Back

A brief history of dams and rivers, through the lens of *World Rivers Review*. Pages 8-9

Healthy Rivers

What do we mean by "healthy rivers"? Pages 10-11

What Future for the World's Rivers?

By Peter Bosshard

By the mid-1980s, river activists in the US had achieved considerable success. Congress had passed the Wild and Scenic Rivers Act in 1968, and a growing number of dams were being removed to bring rivers back to life. Yet internationally, challenges were mounting. Dam builders were promoting huge projects on China's Yangtze River, in India's Narmada Valley, in the rainforest of Sarawak and many other places. They were often supported by the World Bank and by governments that had stopped building dams at home.

Against this background, a group of Californian activists in 1985 launched the *International Dams Newsletter*, a journal from which International Rivers Network (our original name) soon grew. Their goal was "to help citizen's organizations that are working to change policies on large dam construction throughout the world." At International Rivers, we have pursued this goal with passion, tenacity and expertise over the past three decades. We have helped create a strong international network of dam fighters and river activists, and established a global presence in key dam-building regions, with six offices around the world.

Together with our partners, we have stopped several destructive mega-dams, delayed many others, and dis-



Rivers unite us! Chinese river activists make a statement at one of China's rare undammed rivers to celebrate this year's International Day of Action for Rivers.

couraged yet more destructive projects from being proposed in the first place. We have empowered local communities and NGOs to stand up for their rights, and initiated a visionary framework for future decision-making through the World Commission on Dams. Maybe most importantly, we have put the value of healthy rivers and the serious impacts of large dams on the agenda for public debate.

After a lull, the demands of a growing middle class around the world have caused a new boom in dam building. Currently, no less than 3,700 hydropower projects are under construction or in the pipeline. Among the hotspots of this latest wave of dam building are the Amazon, the

Brahmaputra, the La Plata, and the Mekong basins and the rivers of the Balkans. Governments and financiers can no longer deny the serious social and environmental impacts of large dams. In most cases they are however only taking token measures to address these impacts in their decision-making.

The need to move away from fossil fuels makes it easier to argue for the construction of more hydropower plants. Yet rivers and wetlands already belong to the ecosystems most affected by the loss of biodiversity, and we can't allow ourselves to destroy the planet's arteries in order to save her lungs. Hydropower projects are highly vulnerable

Continued on page 14

World Rivers Review

Volume 30, Number 1
ISSN Number 0890 211

Editor

Lori Pottinger

Design and Production

Design Action Collective

Printing

Inkworks

International Rivers

Interim Executive Director

Peter Bosshard

Staff

Monti Aguirre, Ange Asanzi,
Pianporn Deetes, Inanna Hazel,
Chuck Johnson, Emily Jovais,
Bharat Lal Seth, Candace
Lazarou, Tanya Lee, Berklee
Sati, Grace Mang, Samir
Mehta, Brent Millikan, Lori
Pottinger, Kate Ross, Rudo
Sanyanga, David Snyder, Ame
Trandem, Maureen Vachal,
Margaret Zhou

Board of Directors

Deborah Moore (Chair), Jane
Baldwin, Margo Blair, Brent
Blackwelder, Gary Cook,
Virali Modi-Parekh, Kenneth
Greenstein, Robert Hass
(Honorary), Susan Kopman,
Leslie Leslie, Juan Pablo
Orrego, Cymie Payne, Athena
Ronquillo-Ballesteros, Leonard
Sklar, Scott Spann

Contact Us

2054 University Ave., Suite 300
Berkeley, CA 94704-2644 USA
Tel: (510) 848 1155
Fax: (510) 848 1008

Commentary

A FOND FAREWELL

As I wrap up this issue of *World Rivers Review* – my 96th as editor! – I find myself pondering not just the end of this magazine (see article opposite), but also my last days with an organization I have loved since my first day on the job. I am leaving International Rivers, just shy of my 20-year anniversary, with a deep bank of memories and not a few tears. The good news is I'll still be engaged in the world of water, as manager of communications for the Water Policy Center, a new project of the venerable Public Policy Institute of California. I'm eager to engage with my home state's many water issues – especially now, during this historic drought, which is bringing us closer to the edge of our limits and forcing us to confront our priorities.

Working for International Rivers has been a huge privilege. Even after two decades, I still find the issues to be complex, challenging, and incredibly important. The work is about rivers, of course, but at its heart it's about people. I've learned a lot about how much people love their rivers, and to what lengths they'll go to protect them from concrete walls that would divide and conquer them. It's as if peoples' spirits rise to match the wild and beautiful spirit of the rivers that course through their lives. Thank you to all of you who are seeking to elevate and raise awareness about the issues, build solidarity for the cause, and support the people and creatures who depend so directly on our planetary lifelines for their existence.

Engaging with both the big-dam industry as it marches on the world's rivers, and with the communities that bravely defend those rivers, has been at times a wild ride. It's also been an absorbing "school of life" that taught me about the harsh inequities in the world of "development," the amazing cultures and remarkable landscapes associated with rivers, and most happily, the boundless energy and love that the peoples' movement to protect rivers brings to the world stage.

In my 20 years, we've gone from having to parse out expensive phone calls and faxes to communicate with colleagues half way around the globe, to having 24-7 access with free internet phone services and email. On the other hand, we've gone from being a world of readers of newspapers and magazines to one where people expect to get their news for "free" online, making it harder and harder to justify costly print media and first-hand reporting. So, too, for our little world: a small organization like ours cannot justify publishing, printing and mailing paper magazines any longer.

This issue's center spread offers a taste of what *WRR* has brought to the global river movement in its 30-year history. Having a quarterly magazine has given us an opportunity to document a remarkable global struggle at the nexus of human rights and environmental protection. And it's been a sounding board for river lovers everywhere: we've published the writings of luminaries such as Arundhati Roy, Medha Patkar, Robert Hass, Ma Jun, Bruce Babbitt, E.O. Wilson, as well as insights from a host of experts in river systems, biodiversity, renewable energy and dam decommissioning. *WRR* brought you news on critical issues ranging from climate risks to dams, to the role of development banks and China in bankrolling the new dam boom, to insights into better solutions for meeting water and energy needs. Importantly, too, the magazine has for 30 years recorded the ins and outs of key dam conflicts around the world, creating a coherent history of our scattered movement and the biggest struggles we've encountered.

While I'll miss having the hard record that is a quarterly magazine, I know International Rivers will continue to find new and creative ways to document our amazing movement, raise awareness about key issues, and put voice to the stories of people and their rivers. I look forward to taking that journey with them, and ask you to continue your support for this agile, smart, and deeply engaged organization.

And now, it's farewell... Thank you, my friends, for the opportunity to serve you, and the world's rivers, through these pages!

Lori Pottinger



Printed on 55% recycled, 30%
post-consumer recycled waste
paper with vegetable-based inks

Farewell to Lori Pottinger

By Peter Bosshard

Lori Pottinger joined International Rivers in 1995 as the editor of *World Rivers Review*, and soon thereafter added our Africa program work to her plate. Over 20 years, she nurtured, developed, curated and honed our flagship publication. She has grown *World Rivers Review* from a slim black-and-white publication to a proud, full-color magazine with passion, skill and tenacity. On April 22, Lori moved on to become the communications manager of the new Water Policy Center at the Public Policy Institute of California.

Lori has covered a broad range of topics for International Rivers, from the impacts of dams on public health to the vulnerability of dams to climate change. From the beginning, she has consistently put the spotlight on the many positive alternatives to large dams, and has invited Southern activists to raise their own voices in *World Rivers Review*. The fate of people affected by dams in the Lesotho Highlands, along the Nile, the Zambezi and Ethiopia's Omo River are particularly close to her heart.

Lori not only published *World Rivers Review*, she also edited and produced countless reports, fact sheets, video and website features at International Rivers. She has left her mark on all our outreach tools as a meticulous comma queen and a stubborn defender of good editorial style.

Lori is the longest-serving staff member International Rivers has ever had. Throughout her tenure, she has mentored numerous partners, staff members and interns. She has opened her house to visitors and friends of International Rivers, and has offered us a



Lori Pottinger relaxes at Rivers for Life meeting, Mexico, 2010.

never-ending supply of recipes and travel tips. Lori Pottinger has been the team mother and good soul of International Rivers.

"Rivers are for sharing, for protecting, for loving," Lori says. "That's why the notion of walling off a river with a huge dam breaks our hearts." We are grateful to our team mother for having poured her heart and soul into her work for International Rivers for so long. And if the quotation marks at the beginning of this paragraph have been turned into proper American style, you will have seen our watchful editrix at work one last time. ●

World Rivers Review is Moving On, Too

Educating the public about the value of healthy rivers and the impacts of large dams has always been at the core of International Rivers' mission. In fact, we existed as a newsletter before we became an organization.

Over the past 30 years, *World Rivers Review* has informed interested citizens, activists, researchers, government officials and dam builders about news and important developments from the world of rivers. With expertise and commitment, *World Rivers Review* has presented views and insights from

dam-affected communities, frontline activists and river scientists alike. International Rivers is grateful to Angela Gennino, Juliette Majot and Lori Pottinger, who edited and published our magazine with diligence and journalistic passion for almost three decades. The current issue is a testimony to their skills and their legacy.

This is the last print issue of *World Rivers Review*. On April 22, Lori Pottinger moved on to a new position with the Public Policy Institute of California after 20 years of dedicated service. During the past three decades, our ways of communicating with members and the public at large have evolved, and the ways through which our audiences inform themselves have changed as well. You can still find us in print, on the internet, and in the social media. You can find an archive of *World Rivers Review* going back to 1994 on our website. We are currently evaluating our communication tools and will design new ways to keep you informed and engaged. For now, you can sign up to our electronic newsletter, NewsStream, at http://intlrvs/News_Stream.

Thank you for your interest in the world of rivers. ●

WRR covered a lot of ground in 30 years. For a time we even had Chinese and Hindi translations.



Indigenous Activists Face a World of Hurt for Defending Rivers and Rights

By International Rivers Program Staff

Around the world, the proponents of large dams consistently downplay or simply ignore the true socio-environmental consequences and risks of their projects, especially for local populations whose livelihoods depend upon healthy freshwater ecosystems. Such negligence too often is accompanied by gross violations of human rights, including the dispossession of indigenous peoples of their territorial land rights, and the outright denial of the internationally enshrined right to processes of free, prior, and informed consent (FPIC). Such trends are perhaps not surprising when one considers that dam developers, focused on profit maximization, are often responsible for environmental impact and economic viability studies for their own projects, while wielding tremendous influence over government institutions. In many cases, dam investors are linked to mining, agribusiness, and logging industries that seek to reap benefits from extracting natural resources in extensive areas. This situation brings further encroachment into territories and ecosystems upon which local communities depend, which has resulted in numerous human rights violations.

Communities from the Amazon to the Congo, from Mesoamerica to Southeast Asia continue to organize in defense of their rights when confronted by proposals to dam the rivers they depend upon, oftentimes risking severe intimidation and repression. Here we highlight a few examples of community grassroots initiatives to

educate and mobilize in defense of rivers and rights from diverse corners of the world.

Tapajos River, Brazilian Amazônia

Along the Tapajos River, one of the main tributaries of the Amazon, the Brazilian government has planned a series of large dams that would be devastating for the livelihoods and rights of the Munduruku indigenous people. Moreover, the federal government has refused to demarcate a significant portion of the Munduruku territory that would be flooded by one of the proposed dams, as guaranteed by the Brazilian Constitution. In response, the Munduruku people, with support from International Rivers and other partners, have mobilized to defend their rights through a variety of tactics, including denial of authorization of technical studies for dams about which they were not consulted, “self-demarcation” of contested territories, preparation of an “indigenous protocol” that defines how a process of free, prior and informed consent should be conducted, and participation in a public hearing on infrastructure projects and human rights, promoted by the Inter-American Commission on Human Rights in Washington, DC.

Magdalena River, Colombia

Along the Magdalena River, communities have initiated a movement to protect the largest river in Colombia, which has been slated for the construction of 15 new hydroelectric dams. When Upper Magdalena communities realized that El Quimbo Dam was being built without their knowledge and consultation, they created the Association of Affected Peoples by El Quimbo Dam (Asoquimbo). Asoquimbo began to demand the project developer, Emgesa, provide fair compensation for affected communities, especially fisherfolk and farmers who rent land and were not included in the census. Their case ended up in Colombia’s Constitutional Court, which also examined the cases of all dam-affected peoples in Colombia. The Court ordered a new census for El Quimbo and defined dam-affected peoples as those who will suffer the loss of food and housing security, human dignity, or other fundamental rights – a precedent for Colombia.

Parallel to the construction of El Quimbo, the Colombian government gave Chinese state company Hydrochina the contract to prepare the “Master Plan for the Development of the Magdalena River,” which identifies opportunities for investments such as dams, dredging and a big waterway to transport goods for export (especially coal). Asoquimbo, together with Rios Vivos, the national movement to protect rivers, jumped to the defense of the Magdalena, and created a national campaign *We Are All the River* (Somos Todos El Rio). More than 1,000 people participated in the first step of the *We Are All the River* campaign by following the river from its birthplace to the town of La Honda last March. Riding in canoes or walking, riding mules and taking buses alongside the river, people disseminated information along the way and educated people on the plans to develop the river. Participants in *We Are All the River* also seek to present alternative proposals to the destructive projects proposed in the master plan. The next phase of the campaign begins August 7 at the mouth of the river.



People who would be displaced by dams on Brazil’s Tapajos River held a “Die-In” in front of the Ministry of Mines and Energy in 2013. Photo : Brent Millikan



Tumandok people protest the Jaluar Dam. Photo: T. Lee.

Panay Island, Philippines

On the Philippine island of Panay, the proposed Jaluar Multipurpose II Dam – to be built with financing from the South Korean EXIM Bank – will displace an estimated 17,000 indigenous Tumandok people from their ancestral domain. No land has been allocated for resettlement. Instead, the people who will lose their homes and land are expected to migrate to nearby towns, against their will. The affected communities assert that the project proponents have failed to obtain their free, prior and informed consent as outlined in national law and the United Nations Declaration on the Rights of Indigenous Peoples. Despite facing intense intimidation – including death threats, assassination of one of their community leaders, and constant monitoring by military battalions – the Tumandok have organized themselves into the “Jaluar River for the People Movement” to assert their rights to their traditional territories. They have successfully brought the case to the attention of national parliament, the UN Special Rapporteur on the Rights of Indigenous Peoples and South Korean investors. As a result of the community’s vocal and determined advocacy strategies, preparatory works have remained stalled. International pressure also pushed the South Korean investors to conduct a due diligence review of the project’s social and environmental implications before proceeding.

Kunene River, Angola-Namibia Border

For more than a decade, the Himba people have made known their objections to a proposed dam on the Kunene River. The huge Baynes dam project would put an end to their semi-nomadic hunter-gatherer livelihoods, which depend on this river in the dry season especially. In recent years, they’ve worked with legal advisors to voice their concerns; filed a complaint with the United Nations; carried out a number of large protest marches, and submitted declarations against the dam with their government and the UN Special Rapporteur on the Rights of Indigenous People.

Salween River, Myanmar

China’s Sinohydro and the Electricity Generating Authority of Thailand are proposing to build two large dams on the Salween River on the mainstream of the Salween River in Myanmar. These dams would inundate the territories of several indigenous peoples, including the Shan, Pa-o, and Karen. Since the area is considered an armed-conflict zone, there are three army outposts and battalions in the immediate area surrounding the proposed

Continued on page 15

Chixoy Dam: Reparations at Last!

On a Saturday last November, hundreds of Maya community members celebrated a historical event. Guatemala’s President Otto Perez Molina asked forgiveness from the communities for the government’s role in the social, cultural and environmental destruction caused by the Chixoy Dam. Dam reparations set a new precedent – not just for Guatemala but for dam-affected communities around the globe.

The president officially presented the Reparations Agreement that the government of Guatemala and the 33 Chixoy Dam affected communities had been working on for many years. But the perseverance of the people in the Coordinating Committee of the Communities Affected by the Chixoy Dam (COCAHICH) and the savvy negotiations skills of Maya Achi leaders paid off. The agreement includes more than US\$154.5 million to fund individual compensation, infrastructure, development assistance and environmental restoration. Implementation began this year.

The dam was built during a military dictatorship and financed by the World Bank and Inter-American Development Bank. By the time the dam was completed in 1985, more than 400 Maya Achi people had been massacred, thousands more displaced, and the livelihoods of 11,200 families subverted to give way to the dam. Survivors of the massacre were eventually moved to a resettlement village, but their living conditions have always been bad; they’ve lacked access to adequate housing, health care, electricity, water, education and employment. After the dictatorship fell, survivors partnered with international human rights organizations to begin a decades-long struggle for justice.

Governments and financiers seldom step up to take responsibility for the damages caused by their projects. The World Bank and the Inter-American Development Bank for many years failed to recognize their obligations to address reparations for these communities. But beginning in 2008, Bank representatives, government officials and community leaders participated in a negotiations roundtable for reparations. The Reparations Plan of 2010 was the result, but political and economic interests got in the way and the plan was never implemented.

Then in 2014, the US Congress instructed the banks to ensure implementation of the 2010 plan, and the banks began to pressure the government of Guatemala. The US Congress made new loans to Guatemala conditional until the government began implementing the agreement with the Chixoy communities. And so the plan, four years later, gained traction.

Life will never be the same for the Maya Achi. Their loved ones, whose lives were taken to make way for the dam, will not come back. But the Maya Achi can now begin to restore their lives, and restore their dignity.



Lighting candles for Chixoy victims.

The Challenges of Climate Change

Climate change may be the most urgent global environmental issue of our time, bringing with it a host of challenges for rivers and dams. Rivers are key to ensuring the overall function of the planet's ecosystems and the life that depends on them. Put simply, dams change rivers when they are needed most. In the face of a new global dam boom, the other side of the coin is the risk to these investments from more extreme weather (droughts and floods), which could make large dams uneconomic and even dangerous.

What are the main challenges we face regarding rivers and dams, and what are some of opportunities? Over the years we've had a lot of in-depth coverage of the key issues surrounding climate change and dams in World Rivers Review, but here we look forward to what the core issues will be for International Rivers and the river movements we work with around the globe. We talked with International Rivers' Peter Bosshard, interim executive director, and Grace Mang, co-director of programs.

On the question of hydropower and rivers

PB: Almost everyone understands that we have to move out of fossil fuels. In response, dam proponents are arguing that hydropower is a clean source of energy. We need to remind people that dams – particularly in the tropics – produce methane, and are a significant source of greenhouse gases. We have to research and publicize and educate people about this. We also need to strengthen awareness

that many freshwater ecosystems are already suffering under a changing climate – a big stress factor for any ecosystem – and are at the brink of collapse.

GM: At the end of the day, I think most environmentalists would prefer a hydropower dam to a coal-fired power station, which has in part given the green light to the biggest dam building boom the planet has ever seen. Climate change may be the biggest challenge of our generation but it is also not the only challenge. The cost of unbridled hydropower development will be the extinction of healthy freshwater ecosystems, displacement of millions of people, and the re-engineering of the planet's arteries. And the social impacts of dam building in many places are as big and intractable as the environmental problems. In China, for example, dam building has brought about the biggest forced migration of ethnic minorities the country has ever seen. Whether we can afford to pay these debts to avoid a carbon emissions debt is a question that we must confront head-on, and thoughtfully.

PB: I second that, Grace – and we need more information on the size and scope of this river-debt we are accruing. In future we really need to make sure whatever we do has a small footprint on the world's rivers, because we can't rebuild what they are creating for our benefit. We also need to point out the specific safety risks and economic risks that climate change is creating for dams. Floods and droughts we thought might happen once every 100 years now seem to come every few years. As a consequence, dams have become less safe and less economic. By making the place and time of

Continued opposite



Climate change brings great risks to dams, from extreme drought, as exemplified by the 2010 image of a dried up stretch of the Amazon, above; to more unpredictable floods, which destroyed dams in India's Uttarakhand State in 2013, photo opposite. Photos: ©Rodrigo Baleia/Greenpeace (Amazon); Matu Jansangthan (India)

future rainfalls so unpredictable, climate change is pulling the rug out from under the planning methods for dams. Fortunately, better solutions that are less vulnerable to climate change are available.

GM: As Peter says, better solutions are available. Hydropower vs. lower carbon emissions is not a zero sum game. In China – where these issues are being resolved in real time – International Rivers has shown that the belief that hydropower is the only way to chart a low-carbon future for the world’s biggest economy is false. In 2014, we released a river conservation electricity development scenario that showed that China could stop building dams today and still have the resources in renewable energy technologies to make deep cuts to its carbon emissions. The problem was that when we showed our findings to leading climate groups in government and in civil society in China, they said thanks but they really only cared about a commitment to lower emissions, not how we got there. This abdication of responsibility for the planet’s rivers allows dam builders to brush questions of the viability of large dams in a changing climate under the carpet, and ignores the irreversible damage to freshwater ecosystems already pushed to the brink of extinction.

On changes International Rivers would like to see in the ways that dams are managed

PB: Probably for every major infrastructure project, but for dams in particular, there needs to be a really thorough climate risk assessment – how will a changing climate affect a specific project over the next 40-50 years? We also need to understand how climate change in dammed basins will affect those basins’ ability to adapt to a changing climate. Climate science is very complex and we still face many open questions. But such assessments are necessary if we are to predict the long-term viability of projects and their impacts on rivers; we must insist that they be done. Given



the need to reduce our footprint on freshwater ecosystems and the uncertainty about future risks and impacts, we need to prioritize projects that “first, do no harm.” Very often, these projects will not be dams.

GM: Proponents of dams tell us large reservoirs need to be built to secure future water supplies, and claim that those same dams will secure energy for development. As Peter notes, trying to use large dams to both minimize floods and also store water for electricity generation is a recipe for disaster in a changing climate. In Australia, where I am from, mismanagement of dams during heavy rains has actually caused worse disasters for downstream towns

By making the place and time of future rainfalls so unpredictable, climate change is pulling the rug out from under the planning methods for dams.

and cities. In January 2014, the Upper Mekong (which has been heavily dammed in China) had flood surges never seen before, with water levels raising by as much as eight meters overnight. Fishing communities and agricultural lands were wiped out. Although formal explanations are still forthcoming, some experts suspect that emergency release of water from China’s upstream dams to avoid dam collapses cannot be ruled out as a cause of the flood surges, which were experienced as far downstream as Thailand.

On areas where more research is needed

PB: International Rivers has done quite a bit of work about the climate risks to dammed rivers – for example, with the Google Earth production, “Wrong Climate for Damming Rivers” – but I think we need to ramp up our understanding of the climate vulnerability of dams. We have to become more scientifically credible and for that we need some in-depth research on the impacts of climate change on specific basins and projects, such as what we did for the Zambezi Basin. We will also need to strengthen our work on better solutions for meeting energy needs, because currently there is still a risk that when we stop a dam the government may build fossil fuel power plants instead. That risk exists for example in Chile and in Vietnam, where we celebrated decisions to cancel numerous hydropower plants but coal-fired generation is now being ramped up instead. We in the river movement have to be thoughtful, honest and scrupulous about this. We need to ask the question, “Well, if we stop this dam project, will we add another coal power plant?” In response to this question, we have to strengthen our work to show that alternatives to destructive hydropower other than coal exist. And of course they do; what is often lacking is the understanding and political will to address the obstacles that still prevent the best options from going forward.

GM: I agree, Peter, as much as we are asking the climate community to work with us to find solutions to drive low carbon emissions beyond hydro dependent ones, organizations like International Rivers need to be mindful of the domino effects of defending rivers and rights in an era when our natural resources are scarce. We all need to be part of the solution to climate change. ●

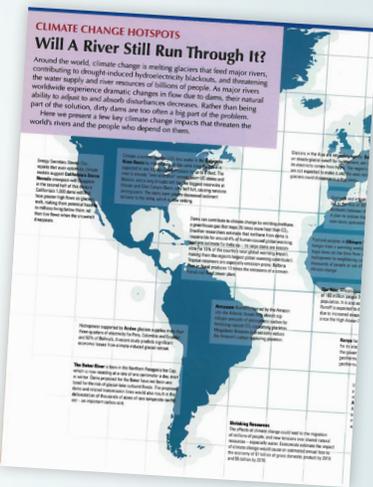
After 15 years of covering the huge social, environmental and economic costs of big dams (and the dearth of benefits accruing to those most impacted by them), **the news of the World Commission on Dams' strong recommendations for improving dam planning was good news indeed.** This special issue culminated two years' of coverage of the independent panel's work; later issues focused on official responses to it, including a cover story on a backlash by the dam industry, which resisted stronger standards that included "free, prior informed consent" for indigenous peoples and better analysis of alternatives to dams as part of the planning process, to name just two WCD recommendations.



China has been the world's biggest dam builder for some time, and the news of its domestic dam projects and their impacts has peppered the magazine for most of its 30 years in print. But China's move into global dam building took the impacts of its dam boom to rivers around the world, and *WRR* was there to help you decipher this troubling trend. The magazine also covered problems with specific Chinese-funded dams in Africa, Asia and Latin America, and efforts by civil society to engage Chinese dam builders over problems its dam projects bring.



Climate change is the grand challenge facing large dams (see p. 6), and we've kept a steady gaze on how a warming climate affects rivers and dams as well as damming's impacts on riverine communities trying to adapt to climate change.



WRR's climate reporting covered topics as diverse as the importance of the Amazon "carbon sink" effect, and how dams could harm this globally important natural process that actually reduces greenhouse gases in the atmosphere; to the mapping of climate-induced droughts and floods that make large dams uneconomic and unsafe, to the lack of proper analysis of these risks on proposed dam projects. We also pioneered reporting on the granting of sham carbon-credit funding for dirty dams in the global south, and on topic of reservoir emissions – something the dam industry would rather not have widely known, as it negates their argument that big-dam hydropower is "clean energy."

How can we meet energy needs while maintaining healthy rivers?

This challenging problem has been a consistent theme. A 2012 special issue took the broad view, with a cover story on communities taking their energy supply into their own hands to ensure a clean and just source of local energy. Feature stories over the years raised awareness about promising new technologies. We've excerpted expert reports on the potential of tapping energy efficiency in Guatemala and featured a plan to bring decentralized clean energy options to rural Mozambique, which would solve energy access problems much faster and more sustainably than planned dams on the Zambezi. ●



My Journey to Understanding River Health

By Jason Rainey

Ten years ago, I stood with others in a circle at the South Yuba River, in my home watershed in Northern California. The fragrance of burning sage mixed with the earthy smell of the pine forest, and the soft rhythm of a hand drum could be heard through the steady roar of the river in full winter flow. Led by an elder, we were participating in an age-old indigenous “First Salmon Ceremony” to welcome the annual return of salmon to the river of their birth, to spawn and pass on. The ceremony concluded with the elder raising a small basket of “salmon medicine” and asking the youngest in the circle to step forward. My daughter, not yet a year old and bundled around my chest, was given the honor of sprinkling the medicine into the water, to let the “salmon people” know that the humans were ready for their return from the ocean to give themselves and “heal” the rivers. You see, we were many miles upstream from a dam; the imparted wisdom was that without their native salmon, this river was unhealthy, or more specifically, in need of healing.

That morning began a journey for me to discover new ways of defining, assessing and understanding river health. Influenced by river science, indigenous wisdom, and my own direct experiences with rivers, I offer several perspectives on how to gauge river health.



The Yuba River in California was where Jason first began his exploration of what makes a healthy river. Photo: Jason Rainey

River health can be impaired by any number of human transgressions or natural phenomena, including industrial and agricultural pollution, land conversion within the watershed (such as deforestation, and urbanization), over-fishing and changes in water flow patterns (water withdrawals, dams and diversions, scheduling river flows according to electricity demands). The cumulative impact of any one of these environmental insults is daunting. For example, dams and their reservoirs now intercept more than a third of river flows as they head toward the sea, a seven-fold increase since 1950. Dams trap more than 100 billion tons of nutrient-rich sediment that would otherwise have replenished farms, deltas and coastal zones. A number of major rivers are so heavily dammed and diverted that they no longer reach the sea for all or part of the year, including the Colorado, the Indus, the Yellow and the Nile.

And yet, not every dammed or polluted river is on death's door. A related truism is that a river need not be “pristine” to be healthy. Even in the most remote and unaltered landscapes and river systems, “pristine” is now an unattainable (atmospheric mercury deposition across the globe, and human-driven climate variability come to mind) and ultimately unhelpful measuring stick. River health should not be viewed as a state to attain, but a dynamic and variable process to allow. Fundamentally, a healthy river is one that has resilience and the ability to self-recover from natural and human-caused disturbances. Thus, an ecologically healthy river will have certain components that allow the river to maintain its *functionality*, including the following physical elements:

- A natural flow, which is the base upon which all other river functions rely. “Natural” flows are, of course, unique to each river, and depend on interactions between climate, topography, geology, vegetation cover, etc. Variability in the quantity, timing and frequency of river flows – over seasons and through years – is natural, and the most crucial element of a healthy river. The plants, fish and wildlife of a river system – which includes its adjacent riparian, floodplain and delta ecosystems – evolved based on natural flow and variability. If that's lost, the food web unravels and biodiversity can decline.
- Sediment and nutrient transport (abetted by natural, dynamic flows) are important components of a healthy river, and are responsible for creating floodplains, sandbars and deltas, and nourishing the river channel and life that depends upon it. Excessive erosion is a sign of an unhealthy river that's out of equilibrium.

Water flow and material transport lead us to another key concept of river health, what river scientists refer to as connectivity. Connectivity moves in all directions: healthy rivers have linear connectivity (in other words, materials flow downstream, fish can migrate upstream), lateral connectivity (high flows allow the river to spread into the floodplains, nourishing lands and recharging water tables) and underground interactions (shallow groundwater filters into the river course, called *hyporheic* connectivity).

Next time you're beside a river, try to see these river functions playing out in real time. Allow your imagination to fill in the details not visible to your eye, or not visible in the present moment: the line of woody debris up on the bank might signal the last big flow event; when might that have occurred? Is it obvious to your eyes

Continued opposite

(and informed imagination) that the components of connectivity and sediment transport have been impaired by upstream “management” of the river flow? Can you diagnosis river health with this view?

The world below

Next, we need to peer below the surface. Even an unhealthy river can cast a lot of misleading beauty. Our eyes take in sunlight reflecting on surface ripples that sparkle like jewels. That seemingly universal beauty has a lot to do with what initially draws us to rivers. But the true composition of the water, and the life and processes under the surface, cannot be ascertained from a view from the riverbank.

Water quality can be seen through relatively simple tests of pH, nutrient concentrations, dissolved oxygen and total suspended solids, for example, and can reveal a lot about the health of a river, especially when sampled over long periods of time. I worked for a time with a local river advocacy and watershed science organization that now has over 12 years of water quality data (taken monthly, from more than 30 locations along the river), with all of the data collected by volunteers from the community. Beyond the incredible service they provide in guiding actions to improve river health, those people have developed new ways of seeing their river.

Taking river health assessments a step further, collecting samples of underwater bug life (the jargon is “Benthic Macro Invertebrates,” or BMIs if you’re in deep) can tell stories of river health that range from oxygen levels in the water column (stoneflies, for example need highly oxygenated water) to the rates of water flow changes (caddisflies, which build little shells made of small stones, get stranded and crushed under the weight of their “shells” if water levels drop unnaturally fast). Aquatic insects are excellent indicators of river health, which is why there’s been a growing movement of rapid river assessments anchored by surveying the bug life underwater. And these creatures are fascinating and fun to get to know!

Beyond serving as indicators, aquatic insects are also a key underpinning of the food web of a river system. Healthy rivers, by definition, support a diversity of productive habitats that in turn support numerous plant and animal species. Riffles, pools, side channels, tributary junctions and root zones of riparian trees – as well as the saline-freshwater mixing zones in estuaries – are all different river habitats, necessary for supporting species diversity and even the different life-phases of a single species.

Seeing rivers through a different lens

Above all, I’ve come to understand that “healthy rivers” are defined, more than anything, by the degree to which a society is able to “see” them for what they are, and through multiple lenses and perspectives. It takes real attention and time to see even a single river fully; as Heraclitus pointed out about 2,500 years ago, you cannot step twice into the same river.

Ancient Greek wisdom about change as the one great constant in the cosmos brings me back to the wisdom of the indigenous elders. After that “First Salmon Ceremony,” I accepted an invitation and committed to meeting regularly with members and leaders of the Maidu tribe. In one of the early meetings, their perspective on this subject of healthy rivers was as clearly articulated as it was foreign to my science-trained mind. Referencing this jewel of a Yuba River, distinguished with “Wild & Scenic” designation and adored by half a million visitors a year, they said something like this:

The river is sick, and it has been a long time. It’s the Salmon People that kept it clean since the beginning – they clean the gravels and they organize the rest of the

Ways Forward for River Health

As the current global dam boom progresses, International Rivers is increasingly working to document cumulative impacts of multiple dams, and seeking basin-wide solutions to protect basic functions of rivers. Our broad model of what changes we are pressing for include:

- Dams should become an option of last resort for managing water and generating electricity. Governments and other actors should adopt state-of-the-art river basin planning and integrated resource planning processes and follow highest social and environmental standards for their water and energy sector projects.
- No more dams should be built on the mainstream of rivers, which play a crucial role for the sustainability of freshwater ecosystems.
- Local communities have been the guardians of freshwater ecosystems for generations. Their voices need to be heard and respected in the protection and management of rivers. River basin projects need to be based on demonstrable public acceptance, including the free, prior informed consent of indigenous peoples for projects on their lands.
- The evidence of planetary-scale impacts from river change is strong enough to warrant a major international focus on understanding the thresholds for “river change” in the world’s major basins, and for the planet as a whole system.

river community and keep it in balance. And they won’t come back under these conditions, and not just because of that dam downstream. The Salmon People are in council out in the ocean, waiting for an indication that the humans are healed and ready to receive them. You see, we have to heal the human relationships and our relationship to the land and the water. Only then can we heal the waters, call back the salmon and restore the health of the river. The healing action comes when we work together. When we heal each other and the wounds we’ve inflicted in the past, then we will have healthy rivers again.

Protecting rivers from the wounds inflicted from new dam development requires a much greater literacy and scientific understanding among decision-makers (and first, by the rest of us) of how rivers function, and why that matters for local and planetary ecology and the society we’ve built on the backs of rivers. Tapping into long-held local wisdom, in whatever river basin or region of the world you call home, is a fine starting place for expanding your understanding of “river health” and seeing where those currents take you. ●

Jason Rainey recently stepped down as International Rivers’ executive director to move back to his home watershed, the Yuba.

It's All About the Rivers: In Conversation with International Rivers' Asia Team

For this final issue of WRR, we turned to some of our regional staff in Asia to ask them about their important work. We spoke with **Bharat Seth** in India, **Pianporn Deetes** in Thailand, and our **China team**.

What river stirs your heart the most?

Bharat: My heart bleeds for the Yamuna. It is a river that flows through my city of birth. But it's a sewage canal, and our city has no connections to the lifeline. The river is in need of a people's movement, with government support. A clean up and plan to let the river flow must become a public spending priority. Then for sheer scale, there's the Ganga: roughly 500 million people dependent on it for irrigation, industry, drinking water and other domestic needs.

China team: We would have to say China's Southwest Rivers, which are the mother of most of Asia's mighty rivers. That includes the Jinsha (Upper Yangtze), Lancang (Upper Mekong), Nu (Upper Salween), Dulong (Upper Irrawaddy), and Yaluzangbu (Upper Brahmaputra). These are mostly transboundary rivers with high biodiversity values and rich in minority cultures. These rivers have been targeted for large-scale hydropower development with cascades of as many as 20-30 dams. Among those rivers, the Nu is the only river that does not yet have big dams.

Pianporn: The Salween River (also known as the Nu in China) is also my choice; its wild and natural beauty still remains, along with very rich biodiversity. The people of the Salween River are strong and brave. While many are marginalized ethnic minorities, often with no citizenship in any country, they stand up and speak out for the river and their rights. They know the importance of the river to their livelihoods and they inspire me.

What are the biggest challenges your program is facing now?

Pianporn: For us in Southeast Asia, the natural resources provided by our rivers are very important. Most people still live in rural areas, and depend on natural resources for food, livelihoods, local economies and culture. While the dam industry may advertise hydropower projects as affordable sources of electricity, this is often not the case. The reality is that the cost for rural farmers and fisherman and their families would be significant, as their ecosystem services are taken away. This is a huge challenge.

The Mekong region is growing very fast, and the hydropower industry and electricity monopolies tell us demand for electricity in the region will double or triple in the near future. This is why we see a lot of plans to build large-scale hydropower – for example, 11 dams on the Lower Mekong mainstream. Do we really need this much electricity for the region? Energy planning in the region has become a monopoly, with just a small handful of people deciding on the plans. There is limited space for civil society to participate in the process. One of our key messages to decision-makers is that we need comprehensive options assessments, following the recommendations of the World Commission on Dams, along with a democratic energy planning process. We need to identify the most sustainable energy options



Pianporn on the banks of the Mekong.

available, and to value ecosystems and rivers, rather than treat them as simply a source of electricity.

Take for example the Mong Ton Dam on the Salween River. Thailand's Energy Authority (EGAT), China's Three Gorges Corporation, and a Burmese company are all involved in the project, however they are still deciding where to sell the electricity, whether it will go to Thailand or China. What this means is that this project is not being built to satisfy the perceived demand for electricity in these countries, but rather to satisfy the construction companies for their own business interests. The Mong Ton Dam will affect the lives of some 300,000 people who have not been informed or consulted about the project. They fled the area in central Shan State during the past two decades due to civil war, and are refugees. What will happen to them when they can no longer return to their homes because their villages have been drowned by a reservoir? This type of decision-making cannot be allowed to continue; companies, investors and governments must be held accountable.

China Team: A lack of baseline information about the environmental status of the rivers is a huge challenge in China. In most cases, it does not exist and the dams are built without it. We work with experts who are willing to work with NGOs long term to document and protect these rivers. These experts build capacity in local NGOs and International Rivers to understand the

value, impacts and changes in China's last remaining free-flowing rivers. In China, hydropower projects can be a sensitive topic and in the past environmental groups' concern for healthy rivers has been conflated with opposition to the government. However, our purpose has always been to show governments around the world the value of healthy rivers and we don't have any hidden agendas.

Bharat: The incumbent government in India is pro-hydro and has also been pushing for a huge scheme to interlink the nation's rivers. Another concern is that the judiciary has taken a favorable stance on interlinking of rivers as part of a public-interest litigation and has called for speedy implementation by forming a committee to expedite the process.

What do you hope the legacy of your team's work on the ground will be?

Bharat: Our vision is to protect the rights of communities by ensuring project proponents do not circumvent existing laws, nor do State and Central government seek to unlawfully expedite destructive dam projects. We also seek to promote environmentally sustainable policies and laws to improve the state of Indian rivers, all the while recognizing community rights over resources in order to prevent skewed distribution of wealth and ensuring projects protect the well-being of affected communities. We have played a crucial role in building a strong, well-informed network of partner groups and movements on a national and regional scale; this network addresses the issues of rivers, dams, and climate change and effectively advocates for legislative and systemic changes.

China Team: We hope that decision makers in China can learn from past experience in dam building and avoid repeating mistakes. We hope China will no longer sacrifice the rivers to ill-managed hydropower development or malfunctioning public policy. We hope China can proactively draw ecological red lines, promote renewable energy, and push for river protection legislation. We especially hope the Nu River can be saved.

Pianporn: Over the past 20 years our team has contributed a lot to strengthening the movement in the region, providing technical support to partners and framing the debate around the impacts



Bharat Seth on a field visit to the Alaknanda, a tributary of the Ganga, in Uttarakhand, India.



Protecting the Nu River for future generations is one of our China Program's top goals.

of hydropower projects. We have been able to see a change in Thailand since the Pak Mun Dam was built. International Rivers has been a part of the Pak Mun Dam movement for the past two decades. It was a case study for the World Commission on Dams and was clearly shown to be unviable. Pak Mun Dam has made it increasingly more difficult to build dams in Thailand as community resistance and public opposition has grown stronger.

What's the most important work you hope to accomplish this year?

Bharat: With the new government, space for dissent has been squeezed. The Ministry of Home Affairs has begun reviewing funding sources of environmental NGOs, many of whose accounts have been frozen this past quarter. In this setting it has become increasingly harder for non-state actors to engage with government; many of our partners are reluctant to even approach the government. We on the other hand are walking a tight rope in attempting to strengthen environmental governance by working with government officials in a non-adversarial and non-confrontational manner, all the while without diluting our stance on issues related to the impacts of hydropower on river health. We are also playing a key role in movement building in the Himalayan region by unifying activists, journalists, academics and others, and sharing news and analysis from the region.

China Team: The Nu is the last battle for Chinese NGOs to fight; the river should be preserved from damming because of its pristine nature and ecosystem values. We hope our work can ensure that future generations can also benefit from a healthy and thriving Nu River system.

Pianporn: Our role in the region is to continue to press for transparency and accountability from decision-makers, and to raise public awareness and create space for greater participation in decision-making around the development of hydropower projects. An important 2015 goal is for the Salween: we want the affected people to be able to participate more in the dam process, the decision-making made more accountable, and hopefully, further delays with the Salween Dams. We are also pressing for the cancellation of the Don Sahong Dam on the Mekong River. While we may be small with just a few people, our work in the region is important and our agenda is big. ●

to the vagaries of climate change, and better solutions are usually available.

Solar power is turning from a hope for the future into a powerful game changer. When we started our work in 1985, solar panels cost \$12 per watt (in today's dollars), and 23 megawatts of solar capacity had been installed around the world. Today, solar panels cost 36 cents per watt and 23 megawatts of solar power is installed every five hours. At the global scale, more solar power than hydropower has been developed since 2010, and prices continue to tumble.

Dam proponents argue that hydropower reservoirs are needed to balance wind and solar power, which are variable and intermittent. Yet the cost of clean battery storage is dropping so fast that reservoirs will not be necessary to balance solar and wind power within five years – before today's planned dams can even be completed. Given the unlimited potential of solar power, financial analysts predict that large, centralized power plants will become “the dinosaur of future power generation: too big, too inflexible, not even relevant for backup power in the long run.”

If we could look back from International Rivers' 50-year anniversary, we think that large hydropower dams may then look as obsolete as the clunky mainframe computers and landline telephone systems of the 20th century. Yet many decision-makers at governments and international financial institutions still work with the mindsets of the 20th century. Government regulations, bank guidelines and the curricula of engineering schools still favor the large, centralized projects of the past. And of course, projects currently in the pipeline will do irreversible damage to many great rivers if they are all built over the next 10 years.

As we look toward the future on the occasion of International Rivers' 30th anniversary, we will stick to our strengths in many

areas. We will continue to defend the world's rivers with passion, tenacity and expertise. We will continue to inject the stark realities from the ground into international debates about water and energy development. And we will continue to strengthen our presence in the hotspots of global river protection, working with an international network of partner groups and social movements.

In other ways, we will adapt to a changing environment. Climate change is affecting all of us, and we will need to strengthen our public education efforts about the havoc climate change is already wreaking on rivers and dams. We will monitor the rapid evolution of renewable energy alternatives, and press for planning and decision-making processes that fully embrace these new solutions.

We will make more efforts to understand and defend the value of whole river basins, rather than protecting rivers one dam at a time. We plan to pay particular attention to the Amazon, Congo, Brahmaputra, Nu/Salween and Mekong basins. These rivers have very high rates of biodiversity and have so far remained largely undammed, but their tributaries and mainstems have become hotspots of the current dam-building boom. If we can keep dam builders in check and promote better solutions in these five priority basins, we can pass on some of the world's most valuable rivers to our children and grandchildren. We will also introduce a model for other important basins around the world.

“We must not replicate the mistakes of the past,” the founders of International Rivers declared as they published that first issue of the *International Dams Newsletter*. “We must change the direction of water development now.” International Rivers will remain committed to this mission as we enter into our fourth decade. We look forward to having you with us. ●



Activists from “Paddling with a Purpose” and Conservamos por la Naturaleza celebrated the 2015 International Day of Action for Rivers in Lunahuaná, Peru.

dam sites, which serve to intimidate local people and have been used to brutally quell activities deemed to be resistant to these government-backed projects. If these dams and others along the Salween River move forward, massive forced evictions and resettlement under the watch of the army is expected, fuelling internal strife and the possible influx of refugees to the Thai border. Resistance to the damming has been ongoing for over a decade. Despite threats and intimidation from the military, affected communities have expressed their opposition by organizing several protests and spiritual ceremonies, hoping their voices from the marginalized corner of the basins will be heard by decision-makers.

Teesta River, Sikkim, India

The Teesta IV hydropower project is part of a planned cascade of dams in this mountainous basin. It will submerge the lands of the Lepchas, causing the forced displacement of this indigenous tribe, the original inhabitants of Sikkim. The Lepchas have vociferously opposed this dam. They believe that the departed soul travels up the river and then rests at the bottom of the nearby Mountain of Kanchendzonga. The dams, they believe, will hinder the departed soul's journey to its final resting place. These and other cultural beliefs have not been taken into consideration in

These cases illustrate the importance of dam-threatened peoples as a critical frontline force in the defense of the world's rivers.

the design of the project. In fact, the social and environmental impact assessment for the project barely mentions the Lepchas, as they were not considered in the project studies, as defined by the Expert Committee of India's Ministry of Environment and Forests. The Lepchas sought to correct this oversight, and met the Committee during its site visit, but they remained unaccounted for. The Lepchas thereafter boycotted the public hearing for the project, which is part of the environment clearance process. The Expert Committee recommended environmental clearance to the project, which the Ministry of Environment and Forests granted. This was done despite an international signature campaign against the project and findings of other reports. These reports, including the Carrying Capacity study of Teesta river basin, report of India's National Board of Wildlife and report of the state's senior forest official, questioned the cascade of dams on the Teesta river and its impacts on the Lepchas. The Lepchas have filed a petition before India's National Green Tribunal challenging the environmental clearance granted to the project. The Ministry's reply filed before the Tribunal does not deny a majority of the issues raised in the petition. The final hearing of the petition is expected to take place in May 2015.

Looking forward

The above case studies reflect just a few of the many examples of how people throughout the world are mobilizing to protect rivers and defend their rights and livelihoods. These cases illustrate the importance of the movements of dam-threatened and dam-affected peoples as a critical frontline force in the defense of the world's freshwater ecosystems.



A boat-load of activists in Chiang Rai province take to the river for the 18th annual International Day of Action for Rivers, to raise awareness about ongoing efforts to protect the Mekong from destructive dams.

Significantly, the companies and financiers involved in dams are often transnational or multinational in nature. This means that there are opportunities to leverage international and regional mechanisms, including the Organization for Economic Co-operation and Development's Guidelines for Multinational Enterprises complaints system, the World Bank's Compliance Advisor Ombudsman and Inspection Panel, and the Inter-American Commission on Human Rights, as well as launching court cases in the home countries of dam-building companies, to hold them to their extra-territorial obligations.

Since demands for recognition of human rights of dam-affected people are enshrined in agreements such as the UN Declaration on the Rights of Indigenous Peoples and the UN Declaration on the Right to Development, international solidarity in these cases can provide a needed boost when communities branded by dam proponents as "anti-development" are pressured to withdraw from their protests. Legal challenges, community mapping to demarcate and assert traditional territories, and initiatives to raise awareness of the impacts of dams are all critical components of the struggles of local people which require ongoing support.

International Rivers has for 30 years been a source of information about the human rights violations associated with large dam projects, and will continue to work side-by-side with grassroots movements and indigenous peoples to help them meet the challenges of defending rivers and rights. We will continue to help them advocate for the realization of principles enshrined in legal instruments for the defense of territorial rights, the implementation of Free, Prior, Informed Consent, and to collaborate on building strategies for the protection of livelihoods and rivers. We believe that to accomplish our goals of defending rights and rivers we need to strengthen civil society networks that unite grassroots organizations, NGOs and other key actors.

To do this, we need help to highlight and garner support for river defenders and their movements and to ensure the participation of grassroots leaders in public events at the national and international levels. We need support to bankroll and roll out legal research, draft lawsuits, organize community events and training courses, develop educational tools in appropriate languages, and to facilitate the exchange of knowledge and practical experience among movements.

In the meantime, as community advocates at the frontlines of defending their land and rivers continue to face repressive consequences and threats to their safety, we need to build a stronger proactive response network, ready to raise the pressure at embassies and corporate headquarters. We hope you will join us. ●



Members of the Pakistan Fisherfolk Forum walk in the Indus Delta on the International Day of Action for Rivers. The group did a 14-day march for the Day of Action to call attention to dam building that will have huge negative effects on Pakistan's delta. The heavily degraded Indus River basin is the most important river system in Pakistan. Dam building threatens the livelihoods of millions who depend on its rich ecosystem.

China Blocks Destructive Yangtze Dam

China's Ministry of Environmental Protection has blocked construction on a controversial megadam that would have flooded the last free-flowing section of the middle reaches of the Yangtze River, the *Financial Times* reported in April.

The Xiaonanhai Dam would have destroyed rare habitat for endangered fish species, including dozens that are found nowhere else in the world. The stretch of river to be flooded was protected by a national nature reserve, as it is the final remaining spawning ground for many native fish. The boundaries of the nature reserve were however redrawn to allow the dam's construction.

"We environmental NGOs have worked on this for six years. We really welcome the news," Zhang Boju of China's Friends of Nature, told the *Financial Times*.

Yangtze fish: More threatened than pandas

The Xiaonanhai area is home to the richest collection of endemic fish species in China and contains the highest number of threatened species in the country. This section of the Upper Yangtze River provides an important ecological corridor for the functional life cycle of endemic fish species and the "Four Great Domestic Fish Species."

The project would not provide significant returns for its investment, nor would it play a significant role in meeting

Chongqing's energy needs. With a higher cost per kilowatt than other dams on the Yangtze, the dam would irreversibly destroy the habitat for around 40 rare and endangered freshwater fish species.

In 2013, WWF China declared that the Yangtze was on the brink of ecological collapse after finding that only 17 of 143 known fish species could still be found in the upper reaches of the river (where it is called the Jinsha). With six megadams already built, three under construction and another 15 planned on the Yangtze, the rejection of Xiaonanhai is a welcome reprieve for China's mother river.

The decision comes as environmentalists fear that more sensitive hydropower projects could be included in China's next five year plan to begin in 2016, eliminating the few remaining sections of China's rivers that are not yet dammed.

The ban on further construction of the Xiaonanhai Dam was not announced formally, but slipped into the approval documents for a different dam, the *Financial Times* reports. ●

Learn more: <http://www.internationalrivers.org/node/4603%5D>