

WORLD RIVERS REVIEW

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The Amazon: Dirty Dams, Dirty Politics and the Myth of Clean Energy

By Brent Millikan

A growing trend in Brazil and other countries is to portray large hydroelectric dams as a source of “clean energy” critical to powering a “green economy.” This catchphrase is resounding at a number of international bodies, including Rio+20, which seeks to prioritize market solutions that reflect the interests of powerful economic and political groups. The risk, now being borne out in Brazil’s dam industry, is the undermining of protections for human rights, ecosystem health and democratic decision-making.

Despite calls for “sustainable development” in the preparations for Rio+20, the discussions thus far have ignored the social and environmental footprint of existing dam projects and the implications of an unprecedented wave of dam building worldwide. Similarly neglected are fundamental questions about the unfulfilled promises of mega-dam projects as engines of “sustained growth,” the vulnerability of dams in relation to global climate change, and the opportunity costs of the current dam boom on alternative energy strategies.

This look at the inner workings of the contemporary dam industry in Brazil provides an opportunity to analyze the coherence between discourse and reality in debates about “clean energy” and the “green economy.”



Dozens of large dams are proposed for the Amazon Basin. Several large dams are already under construction on key tributaries, such as the Tapajós, shown here. Photo: Brent Millikan

Targeting the Amazon

Currently, the rivers of the Amazon basin are being targeted for construction of an unprecedented number of large hydro dams. Up to 40 large dams are planned for construction in the Brazilian Amazon over the next 20 years. Several mega-dams are proceeding rapidly, such as Santo Antônio and Jirau on the Madeira River, and Belo Monte on the Xingu River. In neighboring Peru and Bolivia, new Amazon dam plans are underway, largely as a result of pressure and incentives from the Brazilian government.

Already, the devastating social and environmental consequences of new dam projects in the Amazon are becoming glaringly apparent: uncon-

trolled migration, land speculation, deforestation, depletion of fish stocks, destruction of traditional communities and livelihoods, child prostitution, overstretched urban services in health, education and sanitation. All these phenomena, caused or intensified by mega-dam projects, are increasingly part of the contemporary Amazonian landscape.

Meanwhile, the Brazilian government and its dam industry partners insist that mega-dams are “clean energy,” ignoring solid critiques of these projects by affected communities, social movements, indigenous peoples, religious leaders, human rights and environmental NGOs, and the scientific community.

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Commentary

PUTTING RIVERS ON THE AGENDA IN RIO

In the preparations for the twentieth anniversary conference of the Earth Summit, the word “Rio” flows from everyone’s lips. But are rivers properly integrated into the consciousness – and agenda – of organizers of the official proceedings?

This UN Conference on Sustainable Development – returning to Rio de Janeiro, which hosted the historic Earth Summit in 1992 – brings together governments, corporations, and a subset of NGOs in the official proceedings, while thousands of civil society groups – including International Rivers – will network within the unofficial People’s Summit. In 1992, the conference produced landmark treaties on climate change and biodiversity. Twenty years later, what have we really achieved toward reducing carbon emissions, slowing the rate of species extinctions, and advancing economic development that fosters social and ecological resilience? It’s rather clear that global indicators of shared economic prosperity and ecological health suggest that we’re heading in the wrong direction.

Just on the issue of rivers, for example, the past 20 years have pushed freshwater biodiversity into a crisis situation – extinction rates for freshwater species are four to six times greater than their terrestrial and marine cousins. And the current boom in hydropower dams is being marketed as a response to climate change, yet the science on carbon emissions from reservoirs suggests the world’s 50,000 large dams contribute roughly 4% of human-caused greenhouse gas emissions.

This year, the UN conference is flying under the banner of the “Green Economy.” There’s a basic axiom that says that you can only effectively manage that which you measure. So what will constitute the performance metrics for achieving this “green” economy? If the “Zero Draft” document, which outlines the ambitions of the conference, is any indication, it’s not likely we’ll see a shift beyond the same old measurements of GDP and sustained economic growth. There’s a decades-long tradition of advocacy for a shift in how societies measure economic health – think “Limits to Growth,” “Gross National Happiness” or “What’s the economy for, anyway?” The global climate movement that’s focused on atmospheric carbon has put forth another alternative measurement: 350 parts per million.

Let me bring rivers back into the picture. Rio+20 offers an opportunity to consider another essential measurement of planetary health and sustainable economic development. River health, and the roles that functioning rivers play in localized and planetary ecosystem services, are poorly understood by decision-makers. Yet basic science, history and common sense all tell us that we need a living planet to support life, and healthy rivers are the source.

Finding an appropriate measurement for river health is a complicated affair. Perhaps this complexity is one reason for rivers being all but neglected in broader debates about climate resilience, appropriate energy development, and preservation of local place-based livelihoods. Yet, when looking at energy production, food security, clean water and the web of biodiversity that human society is built upon, there’s no more essential indicator than river health.

In this special issue of *World Rivers Review*, we provide a survey of the key river issues of today, and how they correlate to the themes of sustainable economic development, climate resilience, and preserving the planet’s natural capital.

Roughly two-thirds of the world’s rivers are already dammed and diverted to a degree that has ruptured their ecological functionality. Meanwhile, an unprecedented global dam boom is getting underway. With each new proposed large dam project – there are roughly 120 proposed in the Amazon Basin alone – the Earth’s rivers are on a path to “dying from a thousand cuts.”

There is presently no coordinated international effort by governments to assess and characterize which river systems on Earth, if any, should be sustained for the sake of the biosphere and future generations. Instead, we are “negotiating” the fate of the world’s rivers one dam project at a time, framed by the narrowest of impact assessments and driven by energy demand projections (i.e., wish-lists) proffered by individual nations. Rio+20 is an opportunity to put rivers on the international agenda. I’ll be in Rio looking to build partnerships and creative solutions toward durable legal protections for the world’s last great rivers, while also networking with dam-threatened communities to build our collective capacities to resist proposed destructive dam schemes and advance climate-resilient energy solutions.

I look forward to reporting back from the People’s Summit, in the streets, and from outside the official UN proceedings to share stories from our global movement and to push an agenda for rivers at Rio+20. You can follow along at my blog at internationalrivers.org.

Jason Rainey

Turkish Dam Boom Threatens Anatolian Rivers

By Dr. Güven Eken

In recent years, dam building in Turkey has increased by leaps and bounds. River ecosystems and associated communities are under immense threat, and dams are one of the most hotly debated issues in Turkey. No legal measures have been taken to protect the irreplaceable natural and cultural assets of Anatolia from the impacts of these dam projects.

As it currently stands, the government of Turkey plans to construct 1,738 dams and hydroelectric power plants by 2023. Nearly 2,000 water supply dams are also underway. There is serious concern that in a few years, there will be virtually no healthy rivers systems left in Turkey. There are neither environmental nor sociological impact assessments of these projects at the basin or country level.

Dams are the biggest threat to Key Biodiversity Areas in Turkey: 185 out of 305 of these areas are threatened by dams. More than 100 endemic plants could go extinct or are at risk. Numerous bird, amphibian and mammal species in Turkey will disappear or go through sharp declines as a result of this epidemic of dams.

Civil society movements all over Turkey have initiated campaigns to stop the dam projects and increase public pressure on decision makers. So far, at least 120 lawsuits have been filed against dams. Of these, courts have given decisions for 100 cases until now, and they have decided the stay of execution or cancellation of 93 of them.

“Stop Ilisu, Save Hasankeyf” Campaign

The planned construction of the massive Ilisu Dam on the Tigris River in Southeast Turkey is the largest of the dam projects in Turkey, and one of the world’s most controversial dam projects. Despite widespread opposition, the Turkish government is proceeding with construction of Ilisu, which would inundate more than 310 square kilometers of ancient Mesopotamia (an area equivalent to the size of EU member state Malta). The dam would have a life span of less than 100 years, but leave a lasting legacy of enormous cultural, humanitarian and ecological repercussions.

The 12,000-year-old historic town of Hasankeyf would disappear, along with hundreds of cultural and archaeological sites. Tens of thousands of people would be displaced and important habitats for globally and regionally threatened species would be destroyed. The dam would also affect other important habitats and commu-

nities who live and rely on the Tigris River, which flows through Mesopotamia all the way to the marshes of Basra in Iraq. Globally endangered species that will be affected by the dam include the Egyptian Vulture, Euphrates Soft-shelled Turtle, and the Leopard (Mesopotamian) Barbel.

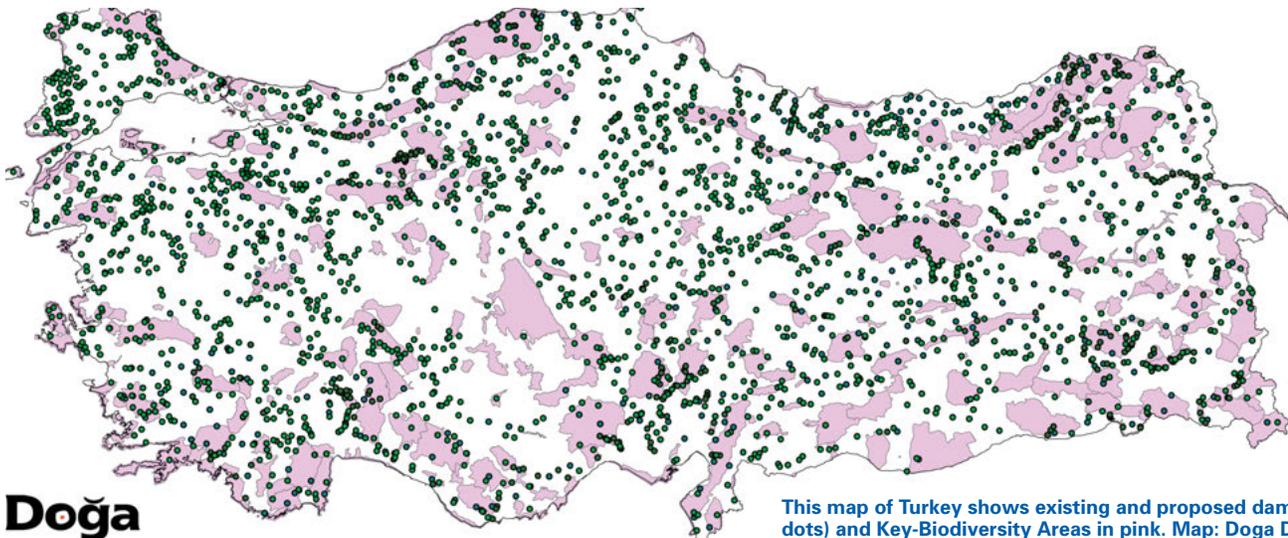
The Ilisu Dam would flood an area so rich in its cultural and natural heritage that it meets nine out of ten UNESCO World Heritage Site criteria. It is the only place in the world to come that close to UNESCO’s requirements, according to a report published by Istanbul University Professor Zeynep Ahunbay, who is also President of the International Council on Monuments and Sites – Turkey, which evaluates nominations for World Heritage status.

The NGO Doga Dernegi has campaigned since 2005 to stop the Ilisu Dam project, proposing a list of alternative solutions to the dam and demanding the government nominate Hasankeyf and the Tigris Valley as UNESCO World Heritage Sites. To this end, we have been closely working with residents and local stakeholders, academics and experts, national and local NGOs, international organizations such as ECA Watch, and the Keep Hasankeyf Alive Initiative.

Our campaigns have resulted in the withdrawal of three European credit agencies from the project in 2009. Never before has an existing export guarantee been cancelled due to ecological, social or cultural concerns. Yet, since the withdrawal of the European funding, the Turkish authorities have declared that the project would go ahead with Turkish funds.

Doga Dernegi’s demands continue to gain strength, and now count on the support of over 100,000 people who signed onto the campaign’s petition. Acclaimed authors and artists have also endorsed our campaign to save Hasankeyf and the Tigris Valley. They include world renowned authors Yasar Kemal and Nobel prize winner Orhan Pamuk, and acclaimed musicians Tarkan and Sezen Aksu.

The possible cancellation of the long-debated Ilisu Dam will also affect the fate of other rivers in Turkey and elsewhere. In order to harness more international support for the Hasankeyf campaign and for the wider river network, we aim to connect the Hasankeyf and Belo Monte (Brazil) campaigns through an international joint initiative. Our focus is debunking the myth of dams as clean energy by demonstrating the planned destruction of the Amazon basin and Mesopotamia. ●



This map of Turkey shows existing and proposed dams (green dots) and Key-Biodiversity Areas in pink. Map: Doga Dernegi

Making Infrastructure Work for the Poor and the Environment

By Peter Bosshard

Kikwit is a town of almost one million people in the Democratic Republic of Congo (DRC). Its inhabitants have no access to electricity. Because the water pumps are no longer working, they have no access to clean water either. In the 1990s, the town made news through an outbreak of the deadly Ebola virus, which was helped by the poor sanitary conditions.

Kikwit is not located at the end of the world. It lies underneath the power lines of the Inga dams on the mighty Congo River. Yet the electric current that hums overhead is not meant for poor people. It is exported to the mining companies in southern Katanga province. Over the past decades, billions of dollars have been invested in the DRC's power sector. They have created a stark energy divide: 85% of the country's electricity is consumed by energy-intensive industries, while 94% of the population has no access to electricity.

There can be no prosperity without infrastructure. But infrastructure has many faces: it supplies water to poor communities and irrigates golf courses, builds local access roads and bridges to nowhere. The example from the Congo Basin demonstrates that infrastructure investment can bypass poor people completely for the benefit of powerful interests. Globally, more than one billion people live without access to clean water, sanitation, and electricity.

Infrastructure has once again become a buzzword of the international development debate in the Rio+20 process. The World Bank and the powerful Group of 20 have prepared new strategies for the hardware of development. They propose to concentrate

investment on large projects with private participation such as big dams and transport corridors that can transform whole regions. They have identified the Inga hydropower scheme on the Congo River as an exemplary project for their new approach. At a cost of \$80 billion, this project would produce electricity for export – and perpetuate the DRC's energy divide in the process.

The development strategies of the World Bank and G20 will generate contracts for global corporations, financing deals for big banks, and opportunities for politicians to cut ribbons and bag some kickbacks along the way. Yet by hoping that social and economic development will trickle down to poor people such as the inhabitants of Kikwit, it ignores the lessons of past experience.

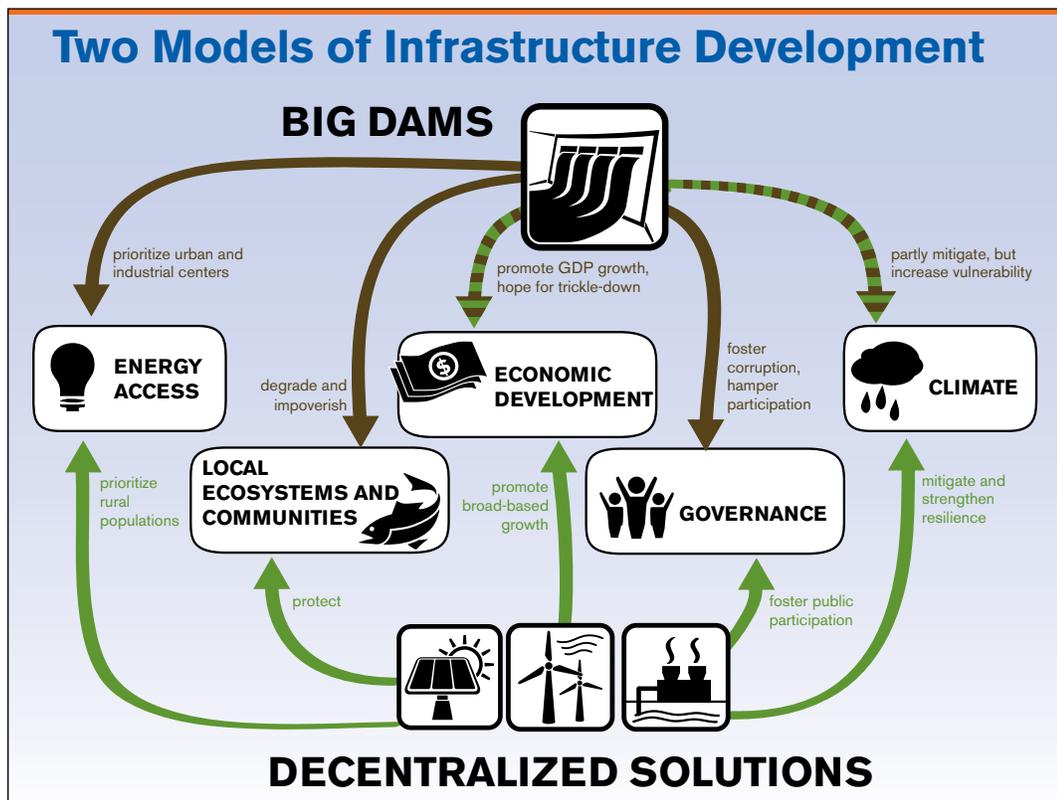
A new report by International Rivers demonstrates that a different approach is available. Most rural poor in Africa and South Asia – the epicenters of global poverty – live closer to local sources of renewable energy than to the electric grid. The International Energy Agency proposes that 70% of the investment needed to provide energy for all should go into local mini-grids and off-grid solutions such as micro-hydropower, solar and wind. The cost of these technologies has fallen rapidly in recent years. High-quality solar lanterns light family homes and charge cell phones at less than half the cost that poor consumers pay for dirty kerosene and candles every year. Yet new technologies are often not available in rural areas even if they are affordable. This is where the World Bank and other donors should come in.

Promoting clean, decentralized energy solutions will not only

provide access for people who have been left in the dark for too long; it will also boost local economic sectors such as agriculture, agricultural processing and tourism, which are important for broad-based job creation. It will reduce the social and environmental footprint of energy projects. By diversifying and decentralizing supply, the same approach will make energy sectors more resilient to the vagaries of climate change. It will also strengthen the institutions of local governments and civil society, which are often overwhelmed by large, top-down infrastructure projects.

This is the kind of sustainable development which the Rio+20 Summit should support. ●

The new International Rivers report, Infrastructure for Whom?, can be downloaded from www.internationalrivers.org/infrastructureforwhom.



A Billion Reasons to Invest in Distributed Clean Energy Access

By Justin Guay

Today the world's population is growing at about the same rate as the population gaining access to electricity. According to the International Energy Agency (IEA) this means that in 2030 there will only be a decrease in the un-electrified population of 23% (a drop from 1.3 to 1 billion). What's worse, nearly 2.5 billion people today considered "electrified" receive only a few hours of electricity per day. In essence we are losing the battle to light the world.

Delivering energy access is therefore one of the central issues for world policymakers to grapple with at Rio+20. The problem is, the biggest power players heading to Rio+20 seem to favor our current approach of large, centralized, regional projects such as big multipurpose dams and fossil fuel plants. Investing in large scale centralized power plants with the intention of stringing power lines to far flung rural areas is simply not working. In fact, according to the IEA, half of those without electricity today will never be wired to the grid. It's clear that if energy access is going to be honestly and effectively addressed, another approach is desperately needed.

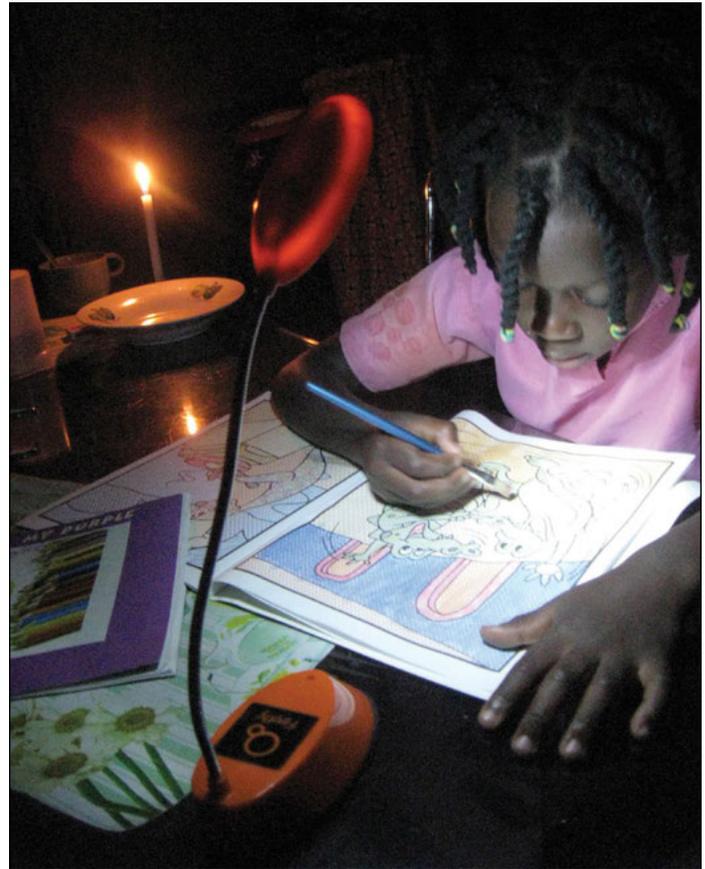
A big part of the problem is cost. The main ingredients of conventional grid power (coal and copper) – are soaring. Meanwhile, the cost of solar panels and LEDs, ingredients of distributed renewable power, are racing down even faster. So it's pretty clear, if we want to deliver on energy access goals in Rio, and if we want the poor to benefit from electricity, we cannot wait for the grid.

Focusing investments on large-scale centralized energy projects such as big dams and fossil fuel power plants is a waste of scarce development resources. Worse, it means relying exclusively on the wrong tool for much of the job. According to the IEA, getting serious about energy access means getting serious about catalyzing distributed clean energy.

For example, most rural Africans live closer to a river than to the grid. Through preliminary research, the Joint Research Center of the European Commission found that nearly 30% of Africa's population lives in areas where mini-grids based on mini hydropower projects are the cheapest source of electricity. In less water-rich regions such as the Sahel, Botswana and Namibia, solar photovoltaics are the cheapest source of electricity. In specific locations, wind or geothermal energy may be cheapest. Based on six country case studies, a report by Christian Aid also found that "geothermal, small-scale hydro, solar, wind, tidal and local biomass fuels, including agriculture wastes, all offer significant potential for delivering both basic needs and for unlocking economic growth."

The situation is similar in India, the biggest hotspot of energy poverty outside Africa. Using conservative cost estimates, Elizabeth Bast of Oil Change International found that in this country electricity from micro hydropower is cheaper than electricity from coal-fired power plants at a distance of less than five kilometers from the grid. Wind-solar hybrid electricity is cheaper than coal at 10 kilometers, and solar photovoltaics, at less than 20 kilometers from the grid.

Happily enough, there are literally scores of social entrepreneurs paving the way to take advantage of this cheaper, faster, and more effective approach to rural electrification. While rural electrification encompasses any number of energy needs including power for mechanical uses, one of the most pressing needs is



This African girl is doing homework by a solar lamp purchased from Barefoot Power, which sells low-cost lanterns and lighting kits in over 20 countries. The company was a winner in this year's Ashden Awards, which recognizes innovators for sustainable energy for the poor. Photo: Ashden Awards

lighting. Husk Power, Frontier Markets, Simpa Systems, SELCO-India, GreenLight Planet, and dozens of other entrepreneurs are now delivering clean, cheap lighting today because the poor already pay for light in the form of polluting kerosene and candles ... and they pay a lot.

The poorest fifth of the world pays one-fifth of the world's lighting bill – but receive only 0.1 percent of the lighting benefits. Kerosene can account for 25-30% of a family's income; globally, that's \$36 billion a year. The problem is the poor do not use kerosene because it is cheap – they are kept poor in significant part because they must rely on expensive, dirty kerosene.

The problem is billions of dollars continue to be dumped into failed grid extension programs – not distributed clean energy markets to rectify the problem. Social entrepreneurs can provide distributed clean energy alternatives to meet many of the energy needs for the poor, but without financing they are unable to buy equipment, pay for employees, or finance purchases for their customers. All of this conspires to keep huge numbers of people dependent on kerosene for lighting; unable to refrigerate vaccines in their clinics and food in their homes, unable to take advantage of modern technologies, and on and on.

Continued on page 11

Our Rivers Feed Millions

River systems support the Earth's highest biological diversity – and the most intense human activity. As a consequence of decades of humans exploiting rivers with large dams, water diversions and pollution, our rivers and the life they support are in a state of crisis.

Large dams flood productive lands, fragment habitat, isolate species, and cut off migration routes. They reduce water and sediment flows to downstream lands, and change the nature of a river's estuary, where many of the world's fish species spawn. These changes are creating crises in food security for those who rely on wild foods and river-supported food crops and animals.

Healthy rivers are the planet's lifelines. We cannot do without the goods and services they provide, and we cannot replicate them. Protecting our rivers now is the health insurance policy we all need for a climate-challenged future. Here we look at just three great rivers that are facing uncertain futures.

The Mekong: River of Fish

By Ame Trandem

The Mekong region's fortune swims in the waters of the Mekong River. A source of food like no other, the Mekong River is home to the world's largest inland fisheries, supplying approximately 20% of the world's freshwater fish and up to 80% of the region's source of animal protein. The river's sediment flows from the upper reaches of the Mekong River to the delta, and is essential for Asia's rice production.

With fish and rice central to the food security and the livelihoods of millions of people, and the Mekong central to the health of these two food systems, it is no surprise that plans to build the Xayaburi Dam in Laos – the first in a cascade of 11 hydro dams proposed for the river's mainstream – has been viewed as one of the most significant threats to sustainable development in the region. As a result, these projects also face significant public opposition within the region and internationally. Most recently, dozens of representatives from Thai communities that will be affected by the Xayaburi Dam protested at the region's Mekong2Rio Conference in Phuket, Thailand. The protestors are asking regional leaders to strengthen transboundary river management on the Mekong River.

It has been estimated that the Xayaburi Dam and other mainstream dams could reduce the Mekong basin's fisheries by up to 42%, which is worth at least US\$476 million per year. Damming would also decrease sediment load by up to 75%. As a result, the food security of some two million people in the region would be at risk, while millions more would suffer impacts to their livelihoods. Experts have warned that effective mitigation of many of these impacts will not be possible. A study by Portland State University estimates that the dams' environmental, social and economic costs could potentially be 10 times greater than the expected benefits.

With such costly tradeoffs, directly affected people in the region should be an integral part of decision-making on these destructive projects.

While debate on whether or not to build the Xayaburi Dam remains underway amongst the MRC member countries, the communities who will be impacted by the project have had little to no



A Mekong fisherman places a fish trap. Photo: Thomas Munita

opportunity to participate in this decision. As a result of concerns raised by civil society groups during a series of consultations held in early 2011, Thailand, Cambodia and Vietnam have requested from Laos further consultation and study on the dam's transboundary impacts.

Despite the growing number of scientific reports demonstrating the harm the mainstream dams will cause to the region, a recent briefing paper put out for the Rio+20 conference by two UN agencies, UNCSO and UNCTAD, touts hydropower export as a "green economy" activity for Laos.

"The Xayaburi and other dams being considered on the Mekong River in Laos cannot be called 'green,'" explains Jerrasak Inthayos, a villager from Chiang Khong, Thailand. "It is unacceptable for UN agencies to promote such a destructive and irresponsible scheme. The dams' transboundary impacts will not only destroy our fish, food security and livelihoods, but also our culture."

It is vital that regional leaders involved in Rio+20 renew their commitment to sustainably manage the Mekong River by ending plans to develop destructive projects like the Mekong mainstream dams.

The Amazon: Teeming with Life

By Kate Ross

The Tapajós Basin, known as the jewel of the Amazon, is a beautiful natural mosaic of healthy ecosystems, protected areas and indigenous lands. It is home to an incredible array of plant and animal biodiversity, which sustain the lives of at least 820,000 people. However this unique and powerful ecosystem is threatened by plans to build a series of massive dams on the Tapajos, and its major tributaries the Teles Pires, Jamanxim and Juruena rivers. These dams would be part of a larger complex of water infrastructure projects in the region, with much of the electricity from the dams going toward the expansion of energy-intensive aluminum and iron ore smelters. Five large dams are planned for the Teles Pires River. The first of these, Teles Pires Dam, has been under construction since August 2011. The project would dramatically and irreversibly damage the quality of life and the cultural heritage of indigenous peoples in the region. The dam would flood the rapids of Sete Quedas, which is the spawning grounds of fish that are integral to the lives of local communities, including the *pintado*, *pacú*, *pirarara* and *matrinxã*. In addition to the importance which these rapids represent to the physical survival of indigenous communities, they also have a powerful cultural significance. According to a recent declaration by indigenous peoples, “Sete Quedas is a sacred place, where the *Mãe dos Peixes* (Mother of



The Amazon's people rely on the river for food, transport and water.

Fish) and other spirits of our ancestors live – a place known as Uel, meaning that it should not be messed with.” As a cultural heritage site it is protected by the Brazilian constitution and international agreements.

The Zambezi: Southern African Lifeline

By Rudo Sanyanga

Life in Southern Africa was for millennia measured by the ebb and flow of the great Zambezi River. Every year the river's waters spilled over into its vast floodplains, irrigating crops, rejuvenating grasslands for livestock and wildlife, depositing nutrient-rich sediments in coastal mangroves, and triggering the lifecycles of countless species. Dry-season flows sustained the productive coastal prawn fisheries. For centuries, people of the Zambezi were the most food-secure in Southern Africa.

Today, the Zambezi's ancient flood cycle has been harnessed by the colossal Kariba, Itzhi Tezhi and Cahora Bassa dams. Some 30 million people in eight nations rely on the river for basic needs, but impacts from dams and competing uses of the river are beginning to fray its ability to provide for all. The middle Zambezi communities – especially the Tonga, who were resettled for construction of Kariba Dam in the 1950s – rely on food aid to see them through most years, even during good rainy seasons. To these people, the construction of the dam came at great cost. The promised regional and local economic growth spurred by hydropower production has remained a dream. This year the Tonga people account for about 40% of the 1.2 million people in Zimbabwe requiring food aid.

Likewise, the people of the lower Zambezi basin are also in need of food aid this season, as they face temporal food insecurity likely to last until the next harvest. The current season's crops have been affected by flooding from heavy rainfall in Northern Mozambique and parts of the Zambezi basin as well as huge continuous discharges from Kariba and Cahora Bassa dams that destroyed their crops and some infrastructure.

The Zambezi dams have badly affected the lower Zambezi valley in Mozambique. Changes to river flow below Cahora Bassa Dam adversely affected hundreds of thousands of downstream households and decimated the Zambezi Delta, one of the most productive and diverse wetland ecosystems in Africa. Due to the lack of the

seasonal variations in flow, the once-lucrative delta prawn fishery has declined precipitously. Populations of Cape buffalo, waterbuck, reedbuck, zebra and hippo have declined by 95% as the now-dry floodplain opened the area to commercial poaching.

Today, a group of social and environmental scientists are working to promote the recovery of the lower Zambezi system through improved management of flows through the dams. There is official interest in the approach, but at the same time, growing pressure to develop numerous new dams on the river, including the farthest along, Mphanda Nkuwa in Mozambique. National, regional and international bodies all show irrational exuberance when it comes to developing the river even further: the Southern African Power Pool has almost \$11 billion worth of new hydro dams in the wings, and a huge increase in diversions from the river for large irrigation projects is planned. Combined with the impacts of climate change, the Zambezi and its people may be facing lean times indeed.



A Zambezi catch. Photo: Lori Pottinger

Rivers At Risk: Dam Boom Threatens



LEGEND

- ◆ **High biodiversity at risk**
- ▲ **Shared Rivers, Dam Conflicts**
- ★ **Damming Hotspots:**
Areas with intensive new and planned damming.
- \$ **Rivers for Sale:**
Denotes nations that are considering dam building for electricity exports. Most have high levels of domestic energy poverty.
- **Delta Blues:**
Marks rivers that are running dry from overuse, or have shrinking deltas.

Selling out rivers for profit:

An agreement between Peru and Brazil commits Peru to supplying more than 6,000 MW of power to Brazil, most of which is expected to come from hydro-power in the Peruvian Amazon. Two projects, the Inambari Dam and the Paquizapango Dam have been prioritized. Peruvians have expressed strong opposition to the projects, given that most of benefits would go to Brazil, with Peru left to bear the costs.

1. Dams support unsustainable industries: Iceland uses more energy per capita than any other place on earth, thanks to energy-hogging aluminum smelters there. The Karahnjúkar Dam, one of Europe's largest, flooded stunning wilderness, including 60 waterfalls. Virtually all of its electricity powers one large smelter. Alcoa Aluminum has since shelved plans for more dams and smelters, but some politicians hope to build an undersea cable to export Iceland's hydropower.

2. Selling out rivers for profit: Canada is already a "hydro superpower"—some 60% of its electricity supply comes from dams. Now, its dam industry wants to launch a

multibillion-dollar dam boom to sell electricity to the US. The Rupert and Churchill rivers are key targets.

3. Climate risk: A warming climate is changing the Himalayas faster than any other region of the world. The range's mighty glaciers, the source of most large Asian rivers, are melting. Yet a slew of new hydro dams are planned, raising major concerns about dam safety and economic viability.

4. Stirring conflict: The Nile, Africa's second largest river, is key to the survival of 160 million people in 10 countries. It is also highly susceptible to climate change. Yet numerous dams are planned for its upper reaches, which will reduce runoff to dryer downstream states

and increase the potential for water conflict.

5. Displacing the indigenous: Around 25,000 indigenous people from 18 distinct ethnic groups live along the Xingu River in the Amazon basin. Plans to build the Belo Monte Dam—the third largest hydro dam in the world—would divert nearly the entire flow of the Xingu, leaving indigenous communities along a 100 km stretch of the river without water, fish, or transport.

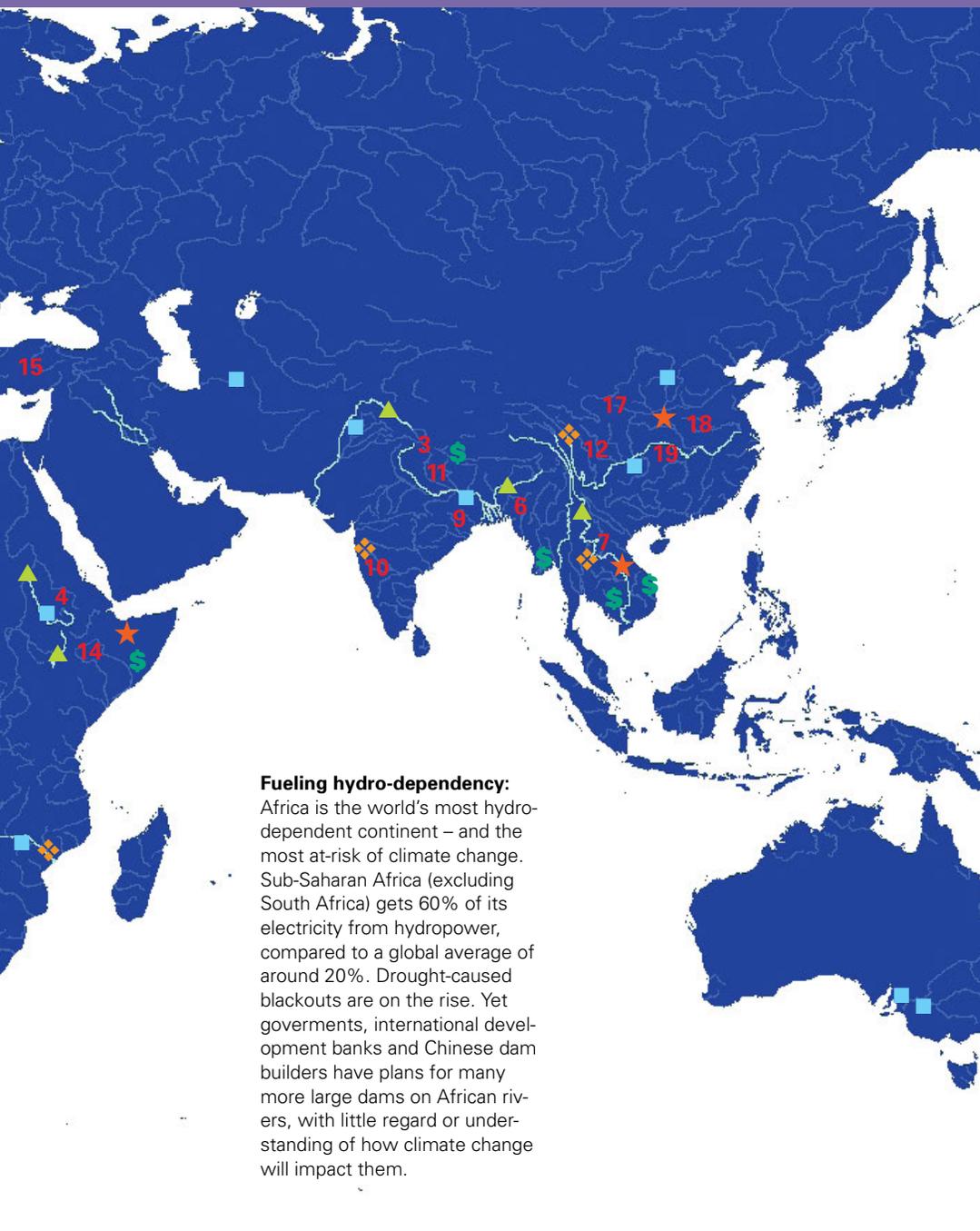
6. Creating conflict: The Myitsone Dam planned for the Irrawaddy River has worsened conflict between the ethnic Kachin people and the military government. The dam's reservoir will

submerge important cultural sites at the Mali and N'mai Hka rivers, as well as what is widely recognized as the birthplace of Burma. Increasing conflict near the dam site has caused over 20,000 locals to flee to the Chinese border.

7. Reducing food security: The Mekong River supports the world's largest inland fishery; at least 2.6 million tons of wild fish and other aquatic resources are harvested each year. Plans to build 11 dams on the Lower Mekong threaten the livelihoods of more than 60 million people who depend on the river.

8. Damming biodiversity: The Rio Plátano Biosphere Reserve is one of Honduras' most important natural and cultural heritage sites.

A World of Rivers



Fueling hydro-dependency:

Africa is the world's most hydro-dependent continent – and the most at-risk of climate change. Sub-Saharan Africa (excluding South Africa) gets 60% of its electricity from hydropower, compared to a global average of around 20%. Drought-caused blackouts are on the rise. Yet governments, international development banks and Chinese dam builders have plans for many more large dams on African rivers, with little regard or understanding of how climate change will impact them.

In 2011 the Honduran congress made a deal with China's Sino-hydro to build the first of three dams on the Patuca River. It would flood a large swath of intact rain forest that was intended to be added to the reserve. In 2011 the site joined the list of World Heritage sites in Danger.

9. Strangling a lifeline: The Teesta River, called the Lifeline of Sikkim, has been so tapped for irrigation and other uses that it has largely dried up. Many fishermen and farmers are no longer able to make a living along its banks. Yet India plans to build dozens of dams along the Teesta.

10. Hotspots cooling fast: India's Western Ghats is one of eight "hottest hotspots" in the world. It is also the world's most heavily populated Biodiversity Hotspot; its rivers provide 400 million people with drinking and irrigation water and electricity from hydropower. Dozens of planned dams pose a major threat.

11. New dam builders pick up bad projects: In July 2011 the Nepali Government cancelled the West Seti Dam. In 2010 the Asian Development Bank pulled out after a campaign by local organizations showing the project's failure to comply with ADB safeguard policies. Since then, China has expressed interest in the project.

12. Sinking standards: The Upper Yangtze River is home to a third of all fish species in China. The government created a Fish Nature Reserve here as compensation for the Three Gorges Dam. Then in 2011 the government re-drew the reserve's boundaries to build Xiaonanhai Dam. The project, with two other proposed dams, is turning the last undammed part of the Yangtze River into a series of reservoirs.

13. No solution for energy poverty: The Grand Inga scheme in the Democratic Republic of Congo is the world's largest planned hydropower project. The DRC is also the lowest ranked nation on the human development index. Project

proponents claim the dam could meet the energy needs of most African households, yet there is no guarantee that a megadam will bring broad-based economic growth. In fact, most Congolese live too far from the grid, and have no money to pay for electricity.

14. Human rights abuses: Dam development in Ethiopia is heavily politicized, and there is virtually no space for public debate or participation. Government repression has increased in the face of strong opposition to the Gibe III Dam, now being built on the Omo River. The controversial dam is also fueling "land grabs", which bring a new set of social concerns and abuses.

15. Cultural history drowned: With 635 large dams within its borders, Turkey is one of the world's most active dam building countries. The proposed Ilisu Dam on the Tigris River would drown the 10,000 year-old city of Hasankeyf. Other planned dams would harm the Mesopotamian Marshes in Iraq, and increase water conflict with neighbors.

16. Europe's healthiest rivers at risk: A new study reveals that the Balkan region has the healthiest rivers in Europe – and also the most proposed dams. Hundreds of large and small dams, including up to 60 large dams, threaten the "blue heart of Europe." NGOs are recommending upgrades to existing dams rather than new ones and protections for the most important river stretches.

17. World's biggest dam builder: China is now the biggest dam builders globally. Chinese companies and banks are involved in some 300 dams being built in 66 countries, particularly in Africa and Southeast Asia.

18. Rivers at breaking point: 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.

19. World's most notorious dam: The Three Gorges Dam is the world's largest hydropower project, and set records for number of people displaced (at least 1.2 million when the dam was built, and more since then), number of cities and towns flooded (13 cities, 140 towns, 1,350 villages), and length of reservoir (+600 kilometers). In recent years the government has begun to acknowledge its many serious flaws.

Reality Check for Guatemala's Energy Plans

Efficiency and Renewables Could Forestall Dams, Study Shows

In 2008, International Rivers' staff visited communities that would be affected by Xalala Dam in Guatemala. We began documenting threats posed by more than 20 dams planned for Guatemala's rivers. Guatemala also has a legacy of poor social and environmental standards on its past large dams. As with many developing countries, energy planning in Guatemala was marked by unrealistic expectations for growth in energy use, political pressure to develop large projects, and incomplete analysis of alternatives to meeting energy needs. Energy analyst **Alex Koberle** was commissioned to research how Guatemala could meet energy requirements while maintaining the health of its rivers. Here he summarizes his key findings.

Guatemala's electricity sector was heavily reliant on imported oil when the government of former President Alvaro Colom set in motion a plan to diversify its power supply in 2008.

The plan, revised but still in place, raised concern from community groups and NGOs for their reliance on large coal and hydropower projects with high potential to cause social conflict and environmental degradation. Proposed dam projects have revived the memories of violence that marred the relocation of Mayan communities caused by the construction of the Chixoy hydroelectric dam in the 1980s.

The original plans made future electricity demand forecasts based largely on estimated GDP growth, but the projected GDP growth rates and the resulting demand projections were overestimates. Although two recent updates to the plan revised yearly peaks downward, the annual growth rates remain high, at an average of 70 to 90 megawatts (MW) per year. Based on these projections, the national energy commission, CNEE, and the government are proposing the construction of several dams and coal plants, many of which are already under construction.

The purpose of this study was to critically examine the government's electricity development plans and to determine if there is a more sustainable and economically efficient solution to meet the country's future electricity needs. We found that Guatemala's energy needs until 2022 can be met with a combination of energy efficiency measures and renewable energy, eliminating the need for new coal or hydro capacity. Such an approach would guarantee Guatemala's future energy supply at lower cost than what is being currently proposed, with the final result being cheaper electricity for the Guatemalan consumer. Here is a summary of some of the key findings.

Electricity demand growth forecasts: To assume GDP growth has a one-to-one relationship with electricity demand growth neglects potential savings from energy efficiency measures that allow the same economic output to be generated from less electricity. Neither the original 2008 plan by the Guatemalan energy commission nor the 2010 update made any reference to energy efficiency to meet future demand. The 2012 update provided one scenario in which significant energy efficiency savings would replace some 450 MW of hydropower. In fact, CNEE claims on its website that there is potential for about 250 MW of savings, an amount comparable to the capacity of Chixoy, the largest hydroelectric plant in the country. Our report uses the 250 MW reported by CNEE and identifies another 145.5 MW of economically viable measures that could be deployed by 2022 at a profit. These are conservative figures reflecting "low hanging fruit" totaling about 395.5 MW that is technologically and economically viable today. The true total potential is likely to be much higher, especially if an aggressive energy efficiency program was to be launched.

Energy efficiency: This growing and complex field is often misunderstood, and so it is in Guatemala, where public perception associates it with simply changing light bulbs or turning off lights. Although residential lighting makes up a large portion of the potential savings, enormous contributions can come from sectors such as public street lighting and industry. Proper sizing of electric motors or the use of variable drives in industrial applications, for example, can reduce peak demand in significant ways while at the same time increasing the profitability of the enterprise.

So why don't businesses take advantage of this? There are several barriers to the deployment of energy efficiency measures in the private sector and these include informational barriers (managers simply don't know about it), financial barriers (high up-front costs despite short payback periods) and regulatory barriers (electricity tariffs that reward utilities for ever-growing sales). Solutions exist to counter these barriers, including public information campaigns and workshops, creation of special credit lines, and redesign of tariff methodology to reward increased efficiency.

CNEE has proposed a national energy efficiency plan to fund and promote energy efficiency, but the plan has remained stalled in Congress for over a year. A lot hinges on the approval of this plan. For example, a credit line from the Inter-American Development Bank (IDB) for US\$100 million for energy efficiency measures is being prepared but it cannot be used until the plan is approved. A smaller IDB loan has funded several pilot projects in the country that show encouraging results. More importantly, a mandate from Congress could force CNEE to include energy efficiency gains as tantamount to new capacity. In other words, when making projections of demand growth, CNEE should be made to include the megawatts saved into its forecasts as if they were megawatts generated by a new power plant.

Renewables potential: Guatemala also has ample renewable energy potential, such as wind, solar and geothermal. Electricity is already produced at utility scale by sugar mills using bagasse biomass to drive turbines. Although there are no utility-scale wind or solar facilities, the first wind farm is currently under construction and should provide about 50 MW of clean capacity by 2014. Feasibility studies are underway for new geothermal plants that would add to the 44 MW currently installed. The cost of solar electricity is still an obstacle at large scales here, but for communities not connected to the grid, solar PV remains a viable alternative to building costly transmission lines. The same can be said of small rooftop wind turbines or micro-hydro power plants. A 165-kW small hydro plant built by the community of Chel has turned the village into an economic hub for the surrounding regions with minimal environmental impact. These distributed generation alternatives may be better solutions to bring electricity to rural communities still

Continued opposite

off the grid rather than building large, centralized power plants requiring expensive transmission lines.

As a method for providing new capacity, improving energy efficiency is the least expensive, has the fewest socio-environmental impacts (if any), and is faster to come online than building new infrastructure of any technology. Reducing demand makes the unused capacity available for other uses, just as a new power plant would. There are numerous examples of highly successful energy efficiency programs in Latin America. The Organización Latina-Americana de Energia reports that recent energy efficiency programs in Brazil, Mexico, Costa Rica, Peru and Cuba have yielded notable results and avoided the need for expensive new power plants. In 2005 alone, Brazil invested US\$52.7 million in energy efficiency initiatives that generated savings of 2158 GWh in electricity and \$960 million in postponed new capacity construction. In the same year, Mexico saved 1,301 GWh, equivalent to the consumption of the state of Baja California Sur. In Mexico, the cost to conserve 1 kW through energy efficiency measures was found to be 75% less than the cost of adding 1 kW of capacity by building new infrastructure. Efficiency measures also resulted in a reduction of 347 MW in capacity and 1,962 GWh in energy demand. It is noteworthy that two of the most successful energy efficiency programs in Latin America – those of Mexico and Costa Rica – have treated the savings resulting from energy efficiency programs as tantamount to new capacity and have included them in their future energy plans and forecasts.

The potential for energy efficiency savings is significant in all sectors of the Guatemalan economy. Therefore, we propose a freeze on construction permits for new generation projects through 2015 while an aggressive energy efficiency plan is launched and implemented. This would ensure that any new projects that come online would provide the most benefit for its



Villagers attend one of a number of meetings held in Guatemala to discuss the new report and Guatemala's energy options. Photo: Alex Koberle

economic, social and environmental cost. Only after aggressive energy efficiency programs have been implemented should new generation projects be given consideration. By that time, new generation and storage technologies may become available and costs will be lower for renewables, meaning a different playing field that is more likely to be better aligned with the realities of electricity generation in the 21st century. ●

The author is an energy consultant specializing in Latin America. The full report, "Energize Guatemala: A Proposal for a Sustainable Electricity Plan," is available in English and Spanish at www.internationalrivers.org

Clean Energy *continued from page 5*

As a result, what you hear over and over again from those on the ground is that there is a desperate need for finance at all levels. Solving this issue, access to finance, is job number one when it comes to delivering on the goals of the United Nations Sustainable Energy For All campaign.

While the private sector will bear a large portion of this responsibility in the long run, what are needed today are public funds that catalyze the market. Making cheap public funds available can help get financial institutions throughout the developing world comfortable with this innovative sector enabling social entrepreneurs and rural families to access the financing they desperately need.

That's where the World Bank and the IFC come in. Both are institutions mandated with alleviating poverty and both have ample amounts of relatively cheap public money to do so. The problem is to date they have not put their money where their mouth is on energy access (though there are sporadic examples of programs delivering important results, like the 30,000 solar home systems deployed every month in Bangladesh).

At the Rio+20 conference the World Bank and IFC have the opportunity to make progress in bridging the energy divide. These institutions can make good on their mandate to alleviate poverty by putting their collective weight behind distributed clean energy. A strong commitment would include:

- At least \$500 million from the IFC for distributed clean energy by 2015 with half of that distributed by the end of 2013.

- A new World Bank program dedicated to distributed clean energy that helps build the pipeline of projects and social entrepreneurs in this sector (This program can and should build upon Lighting Asia and Lighting Africa).

Other actors must step up to the plate as well. The World Bank admits it is not well equipped to fund small projects with a big administrative overhead, such as small renewable energy and energy efficiency projects. Governments should consider new funding mechanisms for innovative, small projects.

The trickle-down approach has not been effective in reducing poverty in many parts of the world. Infrastructure strategies need to address the basic needs of poor population groups directly. Governments and development finance institutions need to significantly scale up support for decentralized water and energy projects, which offer triple benefits in terms of poverty reduction, environmental protection, and climate resilience. This requires full transparency, ongoing consultation processes and other forms of public accountability.

It's time institutions mandated to help the poor understand the current approach isn't working and start getting it right. A commitment to distributed clean energy access on the world stage in Rio is an important opportunity for the World Bank Group and other major players in the energy field. The only question is whether they have the foresight to seize it. ●

The author works for the Sierra Club's climate program in Washington, DC.

A Climate-Safe “Green Economy” Protects Rivers, Rejects Destructive Dams

By Zachary Hurwitz

The twentieth anniversary of the UN Conference on Sustainable Development, or Rio+20, comes at a time when human-caused emissions have pushed our planet to the brink of a climate crisis. The effects of the global industrial economy brought planetary levels of carbon dioxide to a record high of 31.6 gigatonnes (Gt) in 2011, according to a 2012 International Energy Agency (IEA) report – only 1 Gt below the level that the IEA considers necessary to keep global temperatures from rising beyond 2°C. In response, many governments, banks, and corporations are increasingly looking to large hydropower dams to reduce fossil fuel use. Proponents claim that large hydropower dams will help usher in a “green economy.” Rather than achieving greater protection of the planet’s ecosystems from the demands of growing energy use, this policy direction will put an increasing burden on Earth’s freshwater species and habitats.

Large hydropower dams have resulted in a crash in freshwater species, huge social costs, reductions in river flows for users and ecosystems downstream, and significant greenhouse gas emissions. These impacts make them the wrong choice for governments seeking to protect ecosystem services, eradicate poverty, increase energy access, and resolve food shortages in a time of growing climate uncertainty. Decentralized, off-grid solutions make the most sense for a real “green economy.”

Rio+20’s guiding concept of “green growth” focuses on environmental protections through corporate growth, rather than prioritizing the protection of the earth’s critical natural systems – a worrisome shift away from the original intention of the 1992 UN conference. A variety of multi-stakeholder initiatives are being promoted at Rio that aim to advance the goals of the “Green Economy.” Many of them heavily promote large hydropower dams.

One initiative, convened by the private World Water Council, is called the World Water Forum. The sixth World Water Forum met in March of this year in France, where the final declaration called for governments to make commitments in the water sector for Rio+20. One call is for governments to harmonize water, energy and food developments by investing in large multi-purpose hydropower dams. Another is to implement a non-binding auditing tool called the Hydropower Sustainability Assessment Protocol (HSAP) that will allow dam builders to assess and rank their projects as “sustainable.” Both initiatives threaten to greenwash business-as-usual approaches while allowing the private sector to capture more of the world’s water resources.

Another initiative, convened by the United Nations, is called Sustainable Energy for All. It aims to double the global share in renewables, double the rate of improvement in energy efficiency, and universalize energy access by the year 2030. The goals are excellent, but the group’s board is made up of heavy hitters in the global dam industry, including the CEOs of Eletrobras and Siemens, the Chairman of the China Development Bank, the President of the Brazilian National Development Bank, and the World Bank. Sustainable Energy for All has begun gathering government commitments, including one commitment from Norway called Energy+, an offset investment program modeled after the Reducing Deforestation and Forest Degradation (REDD+) program. Energy+ seeks to pool opportunities for Norway (a key dam-building nation) and other high-income countries to invest in the energy sectors of low-income countries. Ethiopia and Kenya, two countries highly dependent on hydropower, have already indicated they will participate.

A third initiative, created at the UN’s 2011 climate meeting in Durban, South Africa, is called the Green Climate Fund (GCF). The GCF is supposed to be about raising finance to bring forth transformative changes to the global economy. One proposal from civil society, for example, is to end fossil fuel subsidies, redirecting them wholesale into the solar market to lower the technology’s price and create economies of scale. However, governments and the private sector have already positioned themselves to submit business-as-usual projects such as large hydro to the fund.

A final initiative, proposed by the Group of 20 (G20), is detailed in the group’s High-Level Report on Infrastructure. The report identifies 11 infrastructure projects to advance “green growth” as one possible way out of the global economic recession; four of them are related to the hydropower sector. One such project, the Grand Inga Complex in the Democratic Republic of Congo, would be the largest, most costly hydropower project ever built (it already has an \$80 billion dollar price tag). Scientists believe that damming the Congo could alter the river’s ability to transport sediment to the Atlantic Ocean, a system which is significant to reducing carbon in the global climate system. The G20 is a closed-door meeting of finance ministers of the world’s wealthiest countries, and is not open to the scrutiny of civil society.

Proponents of large dams are ignoring the risks of climate-changed rivers when they tout them as being a panacea to climate change. The world’s rivers are experiencing more radical swings in hydrological flow than ever before due to human-caused climate change. The Rio Negro in the Brazilian Amazon – still a free-flowing river – suffered two 100-year droughts in just five years, between 2005 and 2010. These troubling droughts were punctuated by two record-setting floods in 2009 and 2012, during which the river submerged parts of the city of Manaus, affecting 77,000 families. Such wild swings in hydrology have led some, including the Sustainability Unit of the World Bank, to call for an increase in large-storage multipurpose dams in order to hedge against the uncertainties of water availability. There is a fatal flaw in this approach: multi-purpose dams built on rivers already suffering from upstream drought will put multiple users in competition for decreasing water assets. Downstream users often bear the costs, as these dams reduce downstream ecological quality and water quantity, making livelihoods less resilient.

Finally, large hydropower dams can cancel out any intentions of developers to offset greenhouse gas emissions produced elsewhere. In the case of both traditional large-storage reservoirs and run-of-the-river reservoirs, large hydropower dams interrupt natural floodplain inundation cycles that feed much needed organic nutrients to areas of carbon sequestration, such as soils and oceans. What’s more, the construction, implementation, and operation of large hydropower dams emit greenhouse gases – especially in the tropics, where decaying vegetation flooded by reservoirs can produce methane, the most potent greenhouse gas.

There are better options for meeting water and energy needs that do not require damaging rivers and the ecosystems they support. At Rio+20, governments, banks, and corporations, public and private sector alike, must heed the multitude of voices calling for a return to the original mission of the 1992 UN Conference on Sustainable Development: to protect life on Earth. We can get there together if we change the focus to investing in true climate solutions for the water-energy-food nexus, rather than greenwashing business-as-usual projects such as large hydropower dams. The future of our freshwater systems, and life on Earth, depends on it. ●

Carbon Offsets Misused by Hydropower Industry

Brazilian Megadams Make Mockery of Clean Development Mechanism

By Katy Yan

The Clean Development Mechanism (CDM) is meant to catalyze climate-friendly and sustainable projects in low-income countries by providing financial support to projects that could not go forward without the extra help. Instead, it's been used to subsidize destructive large dams that fail to meet the CDM's two main criteria: promoting sustainable development, and supporting clean energy projects that are only able to go ahead if they get funding from carbon credits (this is called being "additional" in CDM jargon).

Because of their well-known extensive environmental and social impacts, and because dams in tropical regions can be major emitters of greenhouse gases, many large dams don't belong in a fund devoted to "sustainable development." Yet hydropower projects dominate the CDM pipeline: 27% of all carbon offsets projects registered under the CDM are hydropower projects. Over 1,000 hydropower projects are already registered under the CDM and another 700 are applying for registration, more than any other project type. Through deception and abuse of the system, at least two-thirds of all CDM projects are likely not additional, and more are slipping in each year.

In particular, dam developers in Brazil, India and China are rushing to get their projects registered before stricter rules take effect next year. After 2012 the European Union's Emissions Trading System (ETS) – the largest cap-and-trade scheme – will only accept credits for projects from least-developed countries.

Brazil seeks rewards for damming the Amazon

The increase in projects applying for carbon credits has led to a higher percentage of controversial megadam projects in the CDM pipeline. Three recent examples in Brazil are the 3,150 MW Santo Antônio Dam and the 3,300 MW Jirau Dam (both part of the Madeira Complex) on the Madeira River, and the 1,820 MW Teles Pires Dam in the Tapajós Basin in the Brazilian Amazon. Some key issues raised by Brazilian civil society include the following:

- These projects are not carbon neutral. The latest research in reservoir emissions confirms that hydroelectric plants in the tropics are intrinsically large emitters of CO₂ and CH₄ (methane). In addition to large emissions produced by decomposing vegetation submerged in the reservoirs (particularly in the first 10 years of plant operation), a large amount of methane is also released at the turbines, spillways, and downstream. Moreover, these projects will lead to greater deforestation of the Amazon rainforest – a key climate regulator and carbon sink – through an increase in migration, land speculation, and through their connection with large-scale soybean agribusinesses, which results in the clearing of large expanses of rainforest.

- The EIAs are inadequate and poorly conducted. Experts have criticized the EIAs of all three projects, citing the lack of consideration for transboundary impacts by the Madeira Complex in Peru and Bolivia, underestimation of sedimentation, impact on migratory fish species and subsequent effects on the food security of both



Teles Pires Dam site in the Amazon.

indigenous and urban citizens, and underestimation of reservoir size and greenhouse gas emissions.

- The dams are a setback for environmental sustainability. Since the opening of its gates in 2012, Santo Antônio has caused massive damage along the river and displaced hundreds of communities. Teles Pires would destroy one of the most important spiritual heritage sites of the indigenous Mundurucu, Kayabi and Apicá, flood 95 km² of surrounding land and destroy spawning habitat for more than 200 species of fish.

- The projects violate Brazilian legislation and international agreements around free, prior and informed consultation with affected indigenous communities.

All three hydropower plants have had their environmental licenses legally questioned by federal prosecutors because of their enormous environmental and social impacts. In the case of the Teles Pires Dam, a federal judge suspended its license in March due to a lack of free, prior and informed consultation with indigenous communities as required by Brazilian laws. Brazilian civil society groups have also filed several lawsuits against the Santo Antônio project for violations of Brazilian law.

- Projects are not additional. All CDM projects must show that they would not have been built without CDM financing. The resources for all three of these projects have been guaranteed by private and public investors and public funding through the participation of state companies and the National Bank of Economic and Social Development (BNDES).

Calling for European leadership

Unfortunately, the CDM's track record of preventing the registration of the worst projects, such as those with human rights violations, is poor. In response, several developing countries have asked the UN for permission to withdraw letters of approval for CDM projects that later evidence a breach of human rights laws or serious environmental impacts.

Where host countries and the executive board have failed to restrict harmful projects from the CDM, the European Union has recognized the importance of improving the sustainability and additionality of offset credits entering the EU Emissions Trading System. To this end, the EU commissioned a study to assess the integrity of the CDM that was released in December 2011. In addition to reviewing the performance of the CDM thus far, the authors of the study also discuss potential policy options for reform, which include the option to ban large hydropower projects and improve the environmental integrity of small- and medium-sized projects.

As the largest buyer of CDM credits, sound decisions taken by the EU can both reduce the likelihood of harmful projects entering the CDM and be the catalyst for reforms of the CDM at the UN level, if it is up to the challenge. As its own study has shown, large hydropower projects often do not support sustainable development. Any international climate financing, whether through climate funds or market mechanisms, must support renewable energy systems that improve climate resilience rather than harm the very resources upon which millions of people depend. ●

Lao Dam Tests Chinese Company's Resolve on Standards

By Grace Mang

Earlier this year, I had the opportunity to travel down the Nam Ou (Ou River) in northern Laos. The purpose of my visit was to assess the impacts of seven dams soon to be built by the world's largest hydropower company in this pristine and remote Upper Mekong region. The Nam Ou hydropower cascade is a large project by any measure, yet almost no information is publicly available about the dam plans and projected impacts. The dams' developer, China's Sinohydro, has not publicly released any documents about the project. International Rivers decided to travel the river to get information first-hand.

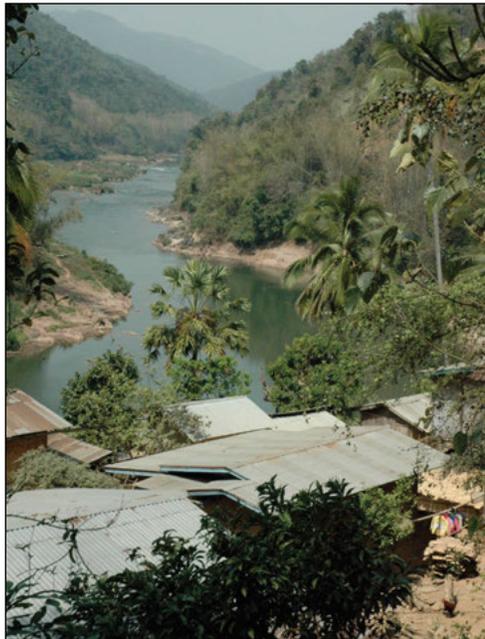
The Nam Ou is one of the biggest and most important tributaries of the Mekong River and critical for its fisheries. The region's remoteness meant that little study been conducted in this basin. Above Phongsali, the largest town in the region, indigenous communities rarely see outsiders, let alone foreigners. The only way to travel here is by boat.

The region's remoteness has not been an obstacle for the Chinese state-owned Sinohydro Corporation, which has been investigating options for a dam cascade since 2007. In April 2011, the Master Agreement for seven dams was signed. In Sinohydro's words, the Nam Ou is the "first time that a Chinese company can obtain the development rights toward the whole river basin." Under the terms of the deal, Sinohydro will build and own the dams for 25 years before handing them over to the Laotian government. After initial plans for the power to be sold to Thailand fell through, Laos now says that the dams will help meet the power demands of northern and central provinces, with the rest to be used for powering a high-speed rail link between China and Laos.

But what about the communities that will be affected – what do they think about the planned dams on their river? I found that villagers were certainly aware of the projects, but in many cases did not know the Laotian word for "dam" or what a hydropower dam might look like. In fact, the first time they had seen a dam was the illustration on the cover of International Rivers' Laotian language report, "Dams, Rivers and Rights."

Many of these people live in villages that had been established for decades – and in a few cases, more than 200 years. All communities rely on the river for transportation and thus communication with the outside world. The river also provides them with food, and electricity from self-installed pico-hydro turbines.

There is no doubt that the lives of the Nam Ou people are very difficult. Several villagers lamented over failed rice crops this year. Young adults were almost always absent from the villages when we visited. Perhaps, then, it was not surprising that many of the people we met said they looked forward to the promise of roads, a new school, new housing, plentiful electricity and a medical clinic that they hoped would come with resettlement. But worry was in the air, too. A village leader said the dam company has "made many promises if we are forced to move. Compensation is not clear and new village location is not clear."



The Nam Ou River. Photo: Grace Mang

We wondered how these communities might adapt to being relocated far away from the river they had come to rely on for so long. They didn't know either. "We don't know if there will be enough water," said one fisherman. "How will I survive without my fruit trees? It will take me 100 years to establish a new farm," said one farmer who had already lost half his farm due to road construction and expected to lose the rest to the dam.

The Global Context

Sinohydro Corporation is responsible not only for its \$2 billion investment in the Nam Ou infrastructure, but also for compensating and restoring the livelihoods of those who will be impacted the most (as with most dam projects the world over, affected people living downstream of the dam project are not considered as "directly affected" and therefore will be uncompensated for their losses). This will be the first time that Sinohydro has carried out such an undertaking. In China, local authorities rather than the dam builders are responsible

for resettlement and environmental mitigation work. In the Nam Ou basin, the fate of thousands will be in Sinohydro's relatively inexperienced hands.

Making Chinese dam builders responsible for livelihood development programs is a surprising turn. Chinese dam builders have only been active in the international hydropower market for the past six to eight years, following the adoption of the "going out policy" by the Chinese government in 1999. Such encouragement led many state-owned companies to find new business opportunities overseas. China's dam building industry has been one of the most successful. Driven by a saturated domestic market and low profits, companies such as Sinohydro have prospered overseas with the support of Chinese financiers such as China Exim Bank and China Development Bank. As with so much of China's rocket-like growth, few would have predicted that in less than 10 years, Sinohydro would control over 50% of the international dam building market.

Laos' biggest dam project to date – the Nam Theun 2 Hydropower Project – brought tensions between the dam's builder, the World Bank, and civil society. NGOs opposed the project for its social and environmental impacts, but ultimately the dam was built. The NGO campaign resulted in the World Bank committing to delivering the best resettlement and livelihood restoration package possible.

Ten years on, the quick rise of China's hydropower companies in international dam building has helped Sinohydro stay under the limelight so far. With Chinese overseas dam builders and banks involved in more than 300 projects globally, it is clear that the business of global dam building has rapidly shifted from the somewhat public multilateral development arena and into the closed boardrooms of Beijing.

International Rivers has certainly made headway in the boardrooms of Beijing. In January 2012 Sinohydro adopted an environmental policy consistent with international standards. We will be working to ensure that these policy statements translate to genuine change on the ground, including for the people of the Nam Ou. ●

What explains this growing “dam fever” in the Amazon despite the glaring contradictions between rhetoric and reality?

First, today’s dam-building industry in Brazil is based on a “triple alliance” between the federal government (especially the Ministry of Mines and Energy and its parastatal energy conglomerate Eletrobras), political patronage groups that control the Ministry of Mines and Energy, and private multinational construction companies (such as Odebrecht, Camargo Correa, Andrade Gutierrez and GDF Suez).

The glue that keeps this alliance together is money. All members of this alliance stand to benefit from the lucrative potential of mega-dam projects, which involve the effective privatization of rivers; the externalization of the human and environmental costs of dams, and privileged access to public financing through subsidized loans (especially from the Brazilian National Development Bank - BNDES) and generous fiscal incentives. The potential for carbon credits is “the icing on the cake” (see page 13). The enormous potential for corruption on large infrastructure projects, combined with the fact that dam construction companies are among the main contributors to electoral campaigns, furthers the strength of this “triple alliance.”

The dam frenzy has benefited from the manipulation of public policies at various levels. First, a pronounced bias toward large dams in national energy policy in Brazil is guaranteed by the absence of public debate and lack of transparency on plans drawn up by the Ministry of Mines and Energy. Official neglect of truly renewable sources of generation such as wind and solar are a striking trait of centralized energy planning, often characterized as a “black box” in Brazil.

River basin inventories to select dam sites involve neither public consultations nor input from environmental agencies. These inventories typically clash with (and predominate over) policies regarding river basin management and protected areas. Inventories are approved unilaterally by the National Electrical Energy Agency (ANEEL).

After dam projects have been politically defined, environmental licensing is a mere formality. In Brazil, there is a recurring tendency for environmental impact assessments carried out by dam proponents to underestimate and externalize their true social and environmental costs, especially in terms of greenhouse gas emissions, impacts on biodiversity, and consequences for the livelihoods of indigenous peoples, riverine populations, fishermen, and family farmers. Moreover, national legislation and international agreements regarding free, prior and informed consultations with indigenous and tribal peoples are simply ignored. Public consultations are theatrical exercises, with no impact on the licensing process.

In the interest of fast-tracking dam projects, decision-makers at the highest levels of the Brazilian government have not hesitated to strong-arm federal government agencies responsible for environmental licensing and indigenous peoples, ignoring the opinions of technical staff and occasional protests from dissenting authorities, which have often been summarily removed from office.

Similarly, decisions by lower-level federal judges in favor of lawsuits regarding gross violations of human rights and environmental legislation on dam projects have been overturned through political intervention by the President’s office in higher-level courts. Meanwhile, the federal government has engaged in political persecution of public prosecutors critical of mega-dam projects and even confronted the Inter-American Commission over its decision on the need for consultations with indigenous peoples on the Belo Monte project.

Increasingly, the dam-building frontier in the Amazon is expanding into legally protected areas, including environmental conservation units and indigenous territories. As a result, the Dilma government is strong-arming the Brazilian Congress to illegally reduce conservation units and loosen restrictions on exploitation of natural resources on indigenous lands. On May 29, the Brazilian

The Amazon River basin covers an area nearly the size of the continental United States; it is shared by nine countries. With more than 1,000 tributaries, the Amazon is the world’s largest hydrographic basin and the source of 15% of all fresh water on the planet. In addition to its unique biological and cultural diversity, recent scientific research confirms the critical role of the rivers and forests of Amazonia in regulating the climate system at a much larger scale.

Congress approved the illegal reduction of more than 75,000 hectares in protected areas along the Tapajos River, a major tributary of the Amazon, to open the way for the first two of more than a dozen mega-dams in the sub-basin. In the Tapajos, the dam industry is closely linked to political and economic interests associated with the opening of industrial waterways (*hidrovias*), energy-intensive mining, logging and export-oriented agribusiness.

Manipulation of public financing for high-risk dam projects, including lack of transparency and accountability, has also characterized the Brazilian dam industry. Financial institutions such as BNDES, the Bank of Brazil, the Bank of Amazônia (BASA) and parastatal pension funds have all been manipulated to fund mega-projects such as Belo Monte and the Madeira dams, with no accountability regarding risk analysis or social and environmental safeguards.

When Luiz Inácio Lula da Silva was elected President of Brazil in 2002, there were great hopes that he would fulfill campaign promises to fight corruption and bring “ethics into politics.” Once in office, Lula and his party, the PT, proceeded to form political alliances with many of Brazil’s most backward regional oligarchs. These alliances have reinforced the dam industry in an unprecedented way.

Dam construction consortia led by the Brazilian government are investing heavily in propaganda campaigns to mislead public opinion about the impacts of mega-dam projects in the Amazon. One Orwellian video widely displayed in Brazilian airports cheerfully announces that Belo Monte will have no impacts on indigenous communities living along the 100-km swath of the Xingu River known as the “Big Bend,” despite the diversion of 80% of the river’s flow upstream.

The Brazilian dam industry juggernaut is increasingly extending its scope beyond the country’s borders. Currently, Brazilian actors are deeply involved in the design, finance and construction of large dams in other countries of the Amazon basin, elsewhere in Latin American and in African nations such as Mozambique, Ghana and Angola. Not surprisingly, Brazilian-led dam-building in other countries repeats the same destructive pattern as at home.

In short, the Brazilian dam boom in the Amazon is a startling example of the tremendous gap between discourse and practice, and should be informing discussions about “clean energy” and the “green economy.”

There can be no “sustainable development” when the development harms human rights and healthy ecosystems or brings political and financial corruption. Clearly, dirty dams founded upon dirty politics are neither “clean energy” nor appropriate for the “green economy” being debated at the Rio+20 conference and beyond.

Slowing the juggernaut of the dam industry in the Amazon and the powerful interests it represents will require a radical democratization of public policy-making (especially the energy sector); true corporate accountability, and vastly increased mobilization in Brazil and neighboring countries to support the rights and livelihoods of dam-threatened and dam-affected communities. ●

Fast Facts on Dams and Rivers

- Percentage of the world's largest rivers now fragmented by dams: **60**
- Number of large dams (>10MW) worldwide: **Approx. 54,000**
- Estimated number of people displaced by large dams: **40-80 million**
- Estimated number of people who have been negatively impacted by the downstream impacts of large dams: **500-800 million.**
- Percentage of annual global development-induced displacement that is a result of dam projects: **40 (over 4 million people)**
- Amount invested in new large hydropower projects worldwide in 2010: **\$40-\$45 billion.**
- Percentage of the world's energy generated through hydropower: **20**
- Countries that account for more than half of the world's installed hydropower capacity (in order of installed capacity): **China, Brazil, US, Canada, and Russia.**
- Number of countries which depend on hydropower for more than 90% of their electricity: **17 (10 of them are in Africa)**
- Number of people in the world without access to electricity: **1.4 billion** (585 million in sub-Saharan Africa, 404 million in India)
- Estimated number of people worldwide with inadequate access to clean water: **1.1 billion**
- Percent of the world's freshwater fish that are endangered, vulnerable or extinct in large part due to dams and the loss of riparian habitat: **20**
- Percent of world's population living in areas with grave threats to human water security or riverine biodiversity: **80**
- Percent of the world's river discharge under moderate to high threat of biodiversity loss: **65**
- Estimated number of freshwater species already extinct or at risk: **10,000-20,000**
- World's largest watershed: **Amazon Basin**
- World's largest inland fishery: **Mekong River**