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THE AMAZON RIVER'S LARGEST TRIBUTARY IS UNDER THREAT

Wilson Dias, Agencia Brasil

Madeira River.

The majestic Madeira River

The Madeira River, the second largest river in the Amazon, is considered a jewel of biodiversity, home to more than 750 species of fish, 800 species of birds, and countless other species, many of them threatened[1]. Its basin covers close to a quarter of the Brazilian Amazon, and stretches over 1.5 million km^2 across Peru, Bolivia and Brazil. The river is formed by the confluence of the Guaporé, Mamoré and Beni Rivers, which originate in the Andean high plains.

The Madeira River is the major affluent of the Amazon River, with a length of 1700 km in Brazilian territory alone and an average flow of 23,000m^3/s. The Madeira is responsible for approximately 15% of the water volume and 50% of the sediment transported by the Amazon River to the Atlantic Ocean. This enormous load of sediment regulates the biological systems of vast flood plains along the Madeira and Amazon Rivers.

A jewel under threat

The Madeira River is under threat by large-scale infrastructure projects associated with the Madeira River Hydroelectric and Hidrovia (industrial waterway) Complex, a fundamental project of the Initiative for the Integration of Regional Infrastructure in South America (IIRSA). This complex includes the construction of: the Jirau and Santo Antonio hydroelectric dams in the Brazilian Amazon, with a joint capacity of 6450MW; a third dam in the stretch between Abunã, in Brazil, and Guayaramerín, in Bolivia; and possibly a forth hydroelectric dam at Cachoeira Esperanza located on the Beni River, 30km above its confluence with the Mamoré River in Pando, Bolivia.

The completion of this complex of dams with locks would allow the operation of an industrial hidrovia, or waterway, to allow the passage of barges, extending 4200 km. This will facilitate the transportation of goods such as soy, timbre and minerals from the Amazon region to ports on Atlantic and Pacific coasts. Other transport infrastructure projects planned for the region and related to the hidrovia include the sealing of three highways: the *Rodovia Cuiabá-Santarém* (BR-163) in Brazil; the *Corredor Norte* in Bolivia, and the *Rodovia Interoceânica* in Brazil and Peru.[2]

The expansion of soy monocultures is one of the main consequences of these infrastructure projects, and may lead to the alteration of Amazon ecosystems to make way for the expansion of the agricultural front. This includes forests, fields and savannas, in a region identified as a centre of plant species diversity and endemism[3].

In addition to the foreseeable increased deforestation, the following are also a threat: extinction and/or reduced diversity of fish species in an area considered a fisheries hotspot; the accumulation in reservoirs of sediments and toxic levels of mercury; impacts on riverbank dwellers and indigenous peoples, as well as urban communities.

The prospect of constructing mega projects along the Madeira River has also sparked political conflict between Brazil and Bolivia. Civil society movements and organisations in both countries have expressed criticism over the way in which the environmental permits process has been conducted by the Brazilian Government, and the involvement of companies accused of corruption.

Learn more, take a stand, and take action for a healthy Madeira River free of dams!

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[1] IRN. The Amazon under Threat: Damming the Madeira, 2006, available at:
http://www.irn.org/pubs/factsheets/madeira/MadeiraFact.pdf#search=%22jirau%20and%20santo%20Antônio%22

[2] CSF. Efeitos de projetos de infra-estrutura de energia e transportes sobre a expansão da soja na bacia do rio Madeira, Conservação Estratégica SÉRIE TÉCNICA **7** maio de 2007, 65p.

[3] WWF. Beni Savanna. Review in process, 2006, available at:
http://www.worldwildlife.org/wildworld/profiles/terrestrial/nt/nt0702_full.html

SOCIAL AND ENVIRONMENTAL RISKS

Lúcia Ortiz

Indigenous peoples protest against hydroelectric dams on Madeira River, may 2006.

The construction of the Madeira River hydroelectric complex, planned by the consortium formed between the state-owned company Furnas and the construction company Odebrecht, could reach an eventual cost of US$ 14.2 billion[4]. This project currently being promoted includes only the Santo Antonio and Jirau dams. Santo Antonio is located 5 km upstream from Porto Velho, the capital of the state of Rondonia and home to more than 270,000 inhabitants, and Jirau is 136 km further upstream. The combined area estimated to be flooded is 529 km^2.

The estimated costs could reach up to U$D 20 billion if needed complementary projects are considered. But the licensing process, carried out by the Brazilian environmental agency Ibama[5], as well as the financial analysis of the project, do not take into consideration the cumulative impacts of related works, such as the construction of the hidrovia or the construction of electrical transmission lines covering 2450 km, estimated to cost up to US$5 billion[6], necessary for distributing energy generated by the plants.

Even so, the impacts of the construction of the two dams alone are of gigantic proportions:

The end for the great fish of the Madeira?

The Madeira is considered one of the most threatened rivers in the world. A study by the World Wildlife Fund confirms that the Madeira River is among the four great rivers whose stability and biodiversity are most at threat.

According to the Brazilian Society of Ichthyology[7](*Sociedade Brasileira de Ictiologia* – SBI), Brazil has the greatest diversity of fresh water fish in the world, with the Amazon basin holding the largest number of species, some of which are still unknown to science. Many of these species (such as *tambaquis, jaraquis, matrinchãs, filhotes, surubins, piramutabas, douradas*, among others) must migrate as part of their reproductive cycles. Impeding this migration causes severe population depletion, and can even lead to the disappearance of the affected populations. The most significant structures impeding migration are hydroelectric dams.

In particular, the species of catfish known as *dourada* (*Brachyplatystoma rousseauxii)* is of great economic importance to the Amazon region, especially the states of Pará, Amapá, Amazonas and Rondônia, in Brazil, and in vast regions of Colombia, Bolivia and Peru. This large fish sits at the top of the food chain in many rivers throughout the Amazon. The *dourada* is one of a group of incredible migratory fish, which annually migrate from Eastern to Western Amazonia, covering a distance of 4000 to 5000 km from the Amazon Estuary to the Andean foothills to reproduce. The *piramutaba* (*B. vaillantii*) and *babão* (*B. platynemum*) also belong to this group. This migration results in the reproductive stocks that live in the Amazon. In the Madeira River, schools of fish take four to five months to swim the 3100 km annually; the distance from the Amazon estuary to the Teotonio rapids (situated upstream from Porto Velho), travelling at a speed of approximately 15 to 19 km per day.

The interruption of this migration may have a great impact on the population maintenance of these species, given that genetic studies have shown that the white water tributaries of the Amazon host *dourada* populations comprising of combinations of different genetic variations. Therefore, environmental alterations and the blocks to migration caused by the construction of dams puts at risk the survival of the great migratory catfish of the Madeira River.

The Brazilian Ichthyology Society (Sociedade Brasileira de Ictiologia – SBI) which brings together the foremost fish researchers of Brazil, has expressed concern over the possibility that anthropogenic alterations to the water cycle of the Madeira River will have irreversible negative effects on fish stocks and the possibility of survival of one of the largest migratory catfish in the Amazon.

Source: 'Manifesto da Sociedade Brasileira de Ictiologia sobre a importância da conservação dos grandes bagres do rio Madeira' published by SBI on 25/06/2007 - http://www.sbi.bio.br

[4] Canal Energia 5/15/2007 Usinas do rio Madeira tem custo estimado de R$ 43 bilhões

[5] Ibama is the Brazilian Institute for the Environment and Renewable Resources, federal body in charge of the environmental licensing process in national level: http://www.ibama.gov.br

[6] Folha de S. Paulo 7/11/2007 Transmissão do Madeira ainda está no papel e Agência CanalEnergia 23/08/2007 LT do Rio Madeira tem licitação prevista para terceiro trimestre de 2008, segundo PAC Linha Porto Velho (RO) - Araraquara (SP) tem extensão estimada de 2,5 mil quilômetros

[7] Manifesto da Sociedade Brasileira de Ictiologia sobre a importância da conservação dos grandes bagres do rio Madeira, 25/06/2007, available at: http://www.sbi.bio.br

Technical viability: sediment content puts the useful life of hydroelectric dams at risk

The Madeira River has one of the largest sediment loads in the world, resulting from erosion that begins in its headwaters in the Andes. Independent studies commissioned by the Rondonia State Public Attorney's Office present various questions regarding the analysis of the impact of sediment flow presented in the Environmental Impact Assessment (EIA) of the viability of dams on the Madeira River.[8]

Philip Fearnside, doctor of Biological Sciences and researcher at the National Institute for Amazon Research (*Instituto Nacional de Pesquisas da Amazônia*) questions the energy efficiency of the development and points out that the data presented in the EIA are insufficient to guarantee that the immense volume of sediments in the Madeira River will not accumulate to the point of preventing water from passing through the turbines.

In response to Ibama's request for further studies, the Ministry for Mines and Energy, with funding from the World Bank, contracted the consultant Sultan Alam to undertake another independent report, published in May 2007. Bolivian hydrologist Jorge Molina points out that Alam's study does not address periods when the river is full, in which the current reaches more than 40,000 m^3/s. The study also does not address at all sediment impacts from the Jirau dam.

In fact, the consultant was not contracted to analyse the environmental impacts caused by sediments, nor water levels or flooding that could result from the project, but to propose solutions to technical problems identified by the Ministry for Mines and Energy, without an integral analysis of the problem or judgement of the environmental viability of the project.

The actual impact of sediments on the viability of the plants is still in doubt.

Bioaccumulation of toxic levels of mercury

Due to prolonged gold mining in the region, the river bed of the Madeira upstream from the planned dams is highly polluted with mercury. Any disruption of this metal could cause it to infiltrate the ground water that supplies part of the capital, Porto Velho.

Scientific studies demonstrate that the characteristics of the reservoirs promote bacterial activity, which in environments featuring low light and oxygen, permit mercury to bio-methylate, enabling it to enter the food chain. This fact is of special concern when considering the potential for bioaccumulation of mercury in the region's food chain, given the diversity of carnivorous fish species, which are the staple of riverbank dwelling and urban populations.

"A reduced stream flow, a greater density of flooded vegetation, and a greater tendency towards anoxia are expected for the lateral margins of the reservoirs. The lack of oxygen could restrict the development of diverse wildlife groups and also promote the methylation and bio-magnification of mercury in these regions."

Source: Independent report by Bruce Forsberg. October 2006, available at http://www.amazonia.org.br/arquivos/226345.pdf Forsberg graduated in biology at Michigan State University and has a post doctorate specializing in Ecosystem Ecology from the University of Washington. Currently he is a researcher and professor at the National Institute for Amazon Research (INPA).

Dislocation of communities and destruction of ways of life

According to the Environmental Impact Study of the planned hydroelectric dams on the Madeira, approximately 3000 will be forced to leave their homes. Taking into account previous dam projects in Brazil and instances of informal land ownership in the region, this number is likely to be an underestimate.

The loss of fish quantity and diversity in the area would severely affect commercial and subsistence fishing. At least 2400 fishermen from communities throughout the region would be left unemployed, due to the extent of the irreversible impacts on catfish species; the region's

[8] Amigos da Terra and IRN. Studies that Don't Hold Water: 30 errors in the Environmental Impact Assessment for the Madeira River hydroelectric complex. November 2006, available at: http://www.amazonia.org.br/arquivos/226345.pdf

predominant commercial catch. According to data from the Rondonia Fishermen's Federation (Federação dos Pescadores de Rondônia - FEPERO), the city of Porto Velho consumes 5 to 6 tons of fish daily.

Thousands of people who live downstream from the reservoirs would face reduced agricultural production as a result of the loss of annual deposits of sediment in the form of fertile mud over flood plains.

In general, the loss of traditional economic activities is not accounted for in the social and economic impacts, which are considered positive due to the creation of temporary jobs in the dams construction.

Amongst the indigenous groups affected, the Karitiana, Karipuna, Oro Ari, Oro Bom, Cassupá, Salamãi and Uru-eu-Wau-Wau would bear the greatest impact from the flux of thousands of migrant workers who already arrive in capital city of Porto Velho searching for work on construction teams. The project's EIA does not take into account the indirect impacts on little-known and un-contacted groups such as the Katawixi and the Kaxarari.[9]

According to Silvanio Antonio de Matia Gomes, executive coordinator of the Amazon Task Force (Grupo de Trabalho Amazônico), riverside dwellers rely on the Madeira River for survival, be it to transport their products or for subsistence fishing. "This is being threatened precisely by the lack of social and environmental responsibility inherent in the project [to build hydroelectric dams along the Madeira River]. We have to pay more attention to all of this, because we are deciding the future for these families, who very soon may be filling the periphery of Porto Velho, without a means of providing their daily food requirements."
Source: Estadão do Norte 23/08/2007 Universitando enfatiza a construção das usinas no rio Madeira

Pressure on urban public services

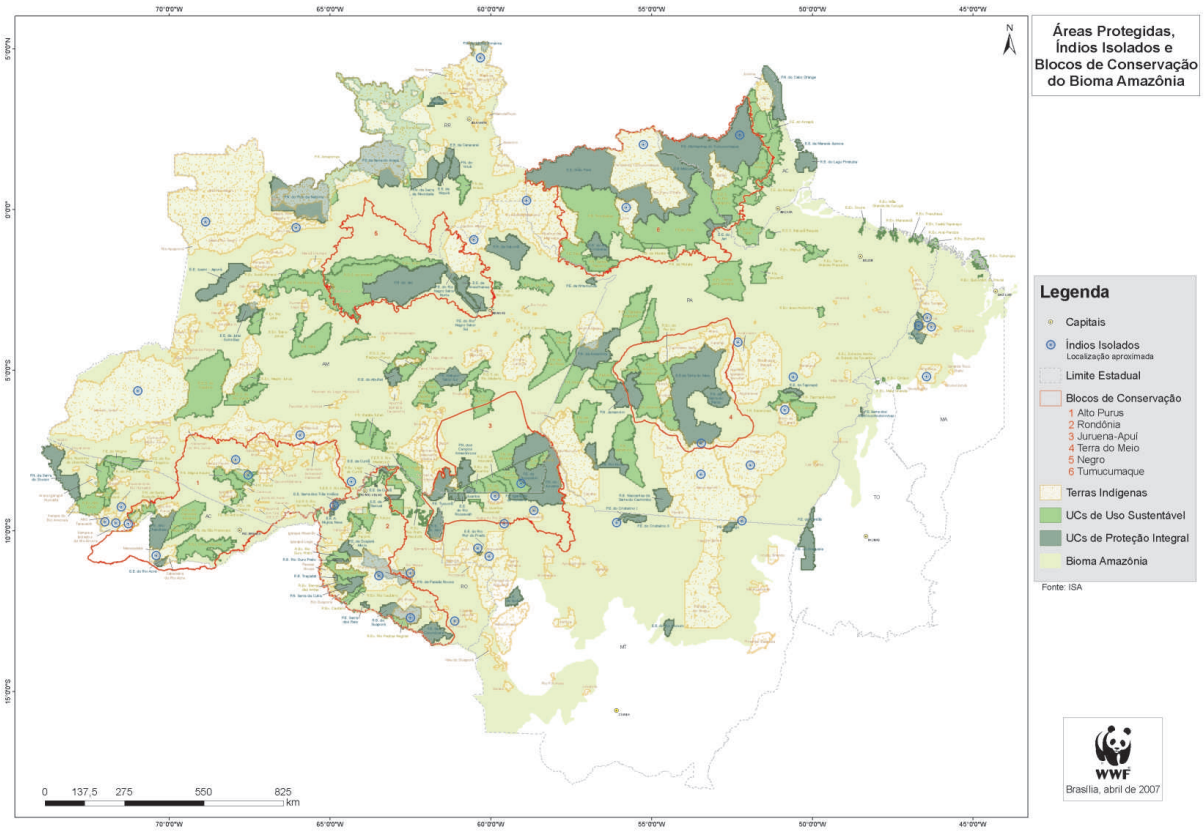
Urbanization brings problems even before works begin. The increased flow of migrant workers to the region increases the demand for, and pressure on, public services, exacerbating current problems. Of particular concern are treated water supplies, and the inadequacy or lack of domestic refuse and sewage services, security, transport, health and public education.[10]

Senator Fatima Cleide Rodrigues da Silva states that significant changes in the socio-economic structure of the region are already taking place as a result of the project. For example, there has been migration to the State due to expected growth and job creation. "The demand for school enrolments for 2007 rose greatly. New commercial developments are popping up in Porto Velho all the time. The civil construction industry is busy." In her opinion, the role of government is to anticipate the problems that may arise and address them now.
Source: Rio Madeira - "A expectativa do projeto já está provocando impactos", diz senadora - 20/11/2006- http://www.amazonia.org.br

Jurandir Rodrigues Oliveira, administrator of the Jaci-Paraná district, near where the government plans to build the plants, says that the anticipation of the project's construction has brought problems to the region. According to him, illegal, unplanned land occupation due to an expectation of 20,000 new jobs has sped up the process of land grabbing and deforestation in the area affected by the dams. The land that is being invaded, illegally staked out and sold, is public land.
Researcher Mauro Tada, from the Rondonia Centre for Tropical Medicine Research (Centro de Pesquisa em Medicina Tropical de Rondônia - Cepem), warns of possible increases in malaria cases in Porto Velho, if the expected migration of 100,000 people attracted by the construction of the hydroelectric plants takes place.
Source: Ambiente Já 28/12/2006 Retrospectiva - Hidrelétricas do Rio Madeira estão entre os mais polêmicos projetos de 2006 - http://www.ambienteja.com.br

[9] Campanha Popular Viva o Rio Madeira Vivo: Barragens no Madeira e a cidade de Porto Velho, 2006, available at www.riomadeiravivo.org
[10] *Idem*

IRSA: THE MEGA PROJECT BEHIND THE MADEIRARIVER DEVELOPMENT



Map of envioronmental protected areas and indigenous peoples in Amazonia

The Madeira-Mamoré-Beni-Madre de Dios Rivers Hydroelectric and Hidrovia Complex, in the Brazil-Bolivia-Peru hub, is the largest of the IIRSA projects.

Proponents of the initiative estimate that the construction of a series of four large dams, with a total cost of more than US$ 20 billion (not including transmission lines with an estimated cost of up to US$ 5 billion), would generate more than 10,000 MW of electricity, in addition to creating an industrial navigation channel, promoting the expansion of soy crops to over 13 million hectares in the Amazon and the Chaco region in Bolivia.[11] According to IIRSA, the project could increase the area planted with soy by 7 million hectares (69,930 km^2) into Brazilian tropical forests and savannas, and affect a similar sized area in Bolivia.

The project is connected with at least three large proposed highways which complete the logistical infrastructure for grain transportation: the *Corredor Norte*, covering 1386 km to link La Paz with Guayaramerín, Bolivia; the *Rodovia Cuiabá-Santarém* (BR-163) built in the 1970s and in the process of being paved, covering 1750 km and linking the city of Santarém on the banks of the Amazon River with Cuiabá, the capital of the state of Mato Grosso, crossing vast areas of savanna (cerrado), transitional forests, and in the stretch between Guarantã do Norte and Santarém an area of inaccessible and sparsely populated forest; the *Rodovia Interoceânica*, also known as the *Estrada do Pacífico*, which is part of the project to extend the BR-317 into Peru, and which links Rio Branco to the border town Assis Brasil in the state of Acre, and will link the Peruvian border town of Iñapari to the ports of Ilo and Matarani on the Pacific, covering 1580 km, and crossing areas of Montana forest, tropical rainforest, and the western portion of the Beni savannas – the third largest savanna complex in South America.[12]

Therefore, when considered within the entire context of the IIRSA, the Madeira complex has a regional dimension affecting sensitive areas of the Amazon, but its cumulative and synergistic impacts are not being taken into account, and were not evaluated in the Madeira River hydroelectric scheme permit process.

[11] www.irn.org
[12] CSF, 2007. *op.cit.*.

POLITICAL RISKS AND CORRUPTION SCANDALS

Lúcia Ortiz

Porto Velho, the capital of Rondonia State: consumption of 5 to 6 tons of fish daily

The controversial permit process: center of the crisis between the Environment Ministry and the Lula government

The permit process for the Santo Antonio and Jirau hydroelectric dams officially began in 2006, but the Terms of Reference for the EIA proposed by Ibama to the state-owned Furnas and the construction conglomerate Odebrecht, the consortium responsible for proposing the project, were issued before the conclusion of the Technical, Economic and Environmental Viability Study, and therefore, without knowledge of the basic design of the project.

In March of the same year, the Environmental Impact Report (EIR) was made public, concluding that for 12 of the 35 impacts listed in the assessment, such as the loss of flora and fauna diversity, "there are no compensatory measures." The proposals to "mitigate" or "compensate" for impacts use terms such as "monitoring," "clarification," "communication," and "raising awareness amongst the local population."

A series of additional studies were requested during the process, and only in September 2006 did Ibama approve the EIA in order to begin the environmental viability analysis.

The study does not take into consideration the catchment basin. Thus, the permit process did not fulfil the legal requirement of the National Environment Council (Conama) for an extensive study of the Madeira River basin.

On October 11 2006, a study by 32 specialists from diverse disciplines was presented. At the request of the State Public Attorney's Office, they had evaluated the EIA and the impact of the dams on ecosystems, the local populations, the life of the river, public health, and even archaeological remains in the region, in addition to highlighting errors and omissions in the EIA[13]. Bolivian researchers expressed criticism to the EIA and pointed out the impacts of the dams over Bolivian territory has been neglected.

In November, public hearings were held. Ibama refused proposals from the civil society for more public hearings regarding the Madeira River developments in addition to the four public consultations planned, which were all to be held in the same week. During the public hearings, held in Porto Velho, Jaci Paraná, Mutum Paraná and Abunã, more than 3200 people expressed their concerns regarding the impacts of the development.

Throughout the process, there were many protests by Brazilian local communities, networks, social movements and civil society organizations against the project. Legal action was also taken by the Federal Public Attorney's Office.

On April 23rd 2007, despite being under strong corporate and governmental pressure, Ibama published a report *critical* of the environmental viability of the development, and requested a new EIA[14]. However, days later the entire leadership team of the Ministry for the Environment were dismissed, and the Ministry was restructured. In the place of a new EIA, Ibama (under new leadership) required the Furnas and Odebrecht consortium to respond to a general series of questions on key issues.

Then, the environmental protection body of the Ministry for the Environment, still coordinated by Minister Marina Silva, granted a Preliminary Environmental License (LP) for the project on July 9, 2007, amidst of strong criticism from Brazilian and Bolivian society. Despite presenting 33 conditions that the dam builders will have to comply with, the LP allows the hydroelectric plants to go to the auction stage, where the winning consortium would be the one that offers future energy sales to the central grid at the lowest cost.

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[13] Amigos da Terra and IRN, 2006. op.cit.

[14] O Parecer e Despacho do Ibama, desvaroráveis ao licenciamento das usinas do rio madeira, available at: http://www.amazonia.org.br/arquivos/241430.pdf e http://www.amazonia.org.br/arquivos/241544.pdf

Lack of transparency: political maneuvers hide the real objectives of the project

The Brazilian Government, through the action of Civil Affairs Minister, Dilma Roussel, decided to withdraw the Madeira navigation project from the agenda, excluding the locks from the construction project of the hydroelectric complex, in a clear attempt to facilitate the granting of the permit. In July 2007, Minister for the Environment, Marina Silva, cited the withdrawal of the locks as one of the improvements made to the project following public consultation and technical analysis, taking into consideration that the hidrovia could have negative environmental and economic impacts on such a highly preserved region. However, in August of 2007, once the LP permit was granted for the two plants, the government decree that set the October 30th date for the auction of the Santo Antonio hydroelectric plant, cited the possibility of constructing a hidrovia along the river to complement the Santo Antonio and Jirau hydroelectric plants, referring to the "eventual construction of navigation projects" along the river.

In an interview with Agência Brasil in June 2007, Ibama superintendent in Rondonia, Osvaldo Pittaluga, deemed that the construction of locks would be necessary in the future as a viable transport alternative, and stated that the government withdrew the issue from the permit process for strategic purposes.
Source: Agência Brasil, 14/08/2007 Portaria do governo cita possibilidade de construção de hidrovia

Mega projects, gigantic costs, enormous opportunities for corruption

Among the companies interested in participating the auction and the construction of the mega-dams along the Madeira is Gautama, a central player in the Lula government's corruption scandal which resulted in Silas Rondeau, the then Minister for Mines and Energy, stepping down.[15]

The Brazil-Bolivia conflict

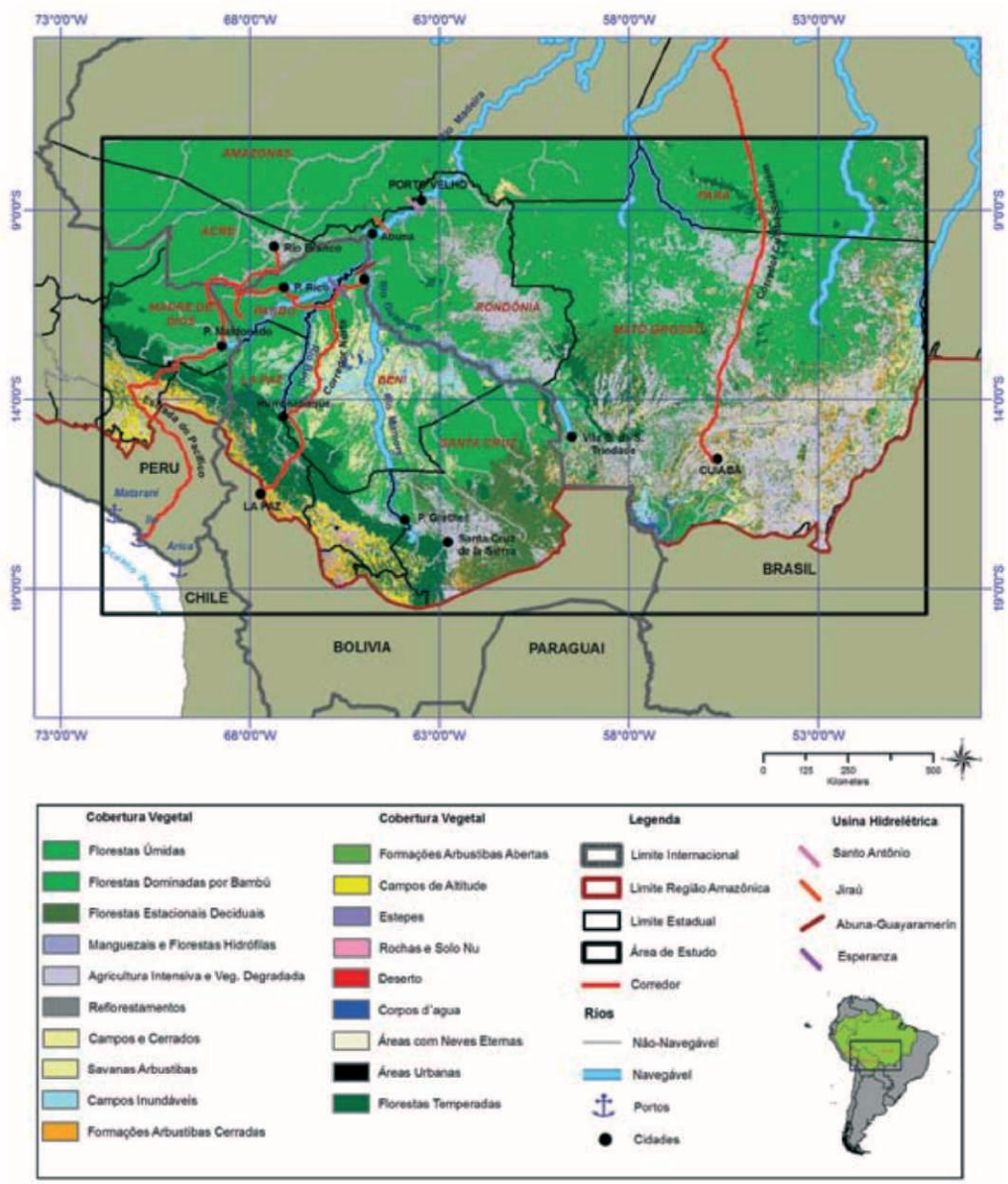
The Madeira River drains practically the entire Bolivian Amazon region, an area of 724,000km^2 or 66% of Bolivia's national territory. The developments on the Brazilian side have provoked controversy regarding the possible impacts for Bolivia.

Analysing the EIA for the two dams, biologist Bruce Forsberg pointed out a possible error in the EIA's calculation that would represent "an increase of more than 100% in the flooded area." Philip Fearnside, PhD in Biological Sciences and researcher at the INPA, also claims that the area of flooding caused by the Jirau plant will be larger than predicted: "a greater area in Bolivia would be flooded when the river flow is higher than normal."[16]

Results of a study by the Conservation Strategy Fund regarding the effects of transport and energy infrastructure projects on the expansion of soy in the Madeira River basin indicate that "future hidrovia and road paving projects in the border region between Bolivia, Brazil and Peru, in the southwest of the Amazon basin, have a significant potential to stimulate the expansion of soy due to reduced transport costs. In every simulated scenario, the northern region of Bolivia will be most heavily affected, both in economic and ecological terms."[17] The same study found that the construction of the Jirau and Santo Antonio hydroelectric dams and the paving of the *Corredor Norte* and the *Rodovia Interoceânica* would expand the area of potentially high soy yields from 853,474 km^2 to 976,803 km^2, an increase of 13%. The forest would be the most affected land use category.

[15] Folha de S. Paulo 6/1/2007 - Gautama queria licitação do rio Madeira
[16] Friends of the Earth and IRN, 2006. *op.cit*
[17] CSF, 2007 *op.cit*.

Despite these warnings, the Brazilian government has maintained its unilateral approach to granting permits for the developments along the Madeira, without participation from the Bolivian government, sparking a diplomatic crisis that is still in full swing (as of August 2007), and three bi-national commissions have now been formed to evaluate key issues involving potential impacts on Bolivia.



Map of infra-structure. Source: Conservation Strategy Fund

FINANCIAL MEGA RISKS

Lúcia Ortiz

Madeira Rivers, the Amazon River's largest tributary with a length of 1700 km in Brazilian territory.

The social, environmental, and political risks already demonstrated during the problematic history of the Madeira complex are also reflected in large financial risks, which should be considered by financial institutions and investors potentially interested in bidding for the right to build the Santo Antonio and Jirau dams. The fragility of the environmental licensing process could provoke diverse legal actions and interrupt the building of the dams, even after construction begins, which would be disastrous for investors and funders. Furthermore, the licensing of the 2450 km transmission line which will take the energy to centers of consumption in southeastern Brazil has not yet taken place. There are great risks that this essential component of the project will be delayed, which could lead to a situation where energy which can be produced cannot be consumed, which would also be a serious blow to the project's financial health.

In March, 2006, at the beginning of the licensing process, Guido Mantega, then-president of Brazil's National Economic and Social Development Bank (BNDES), said that the construction off the Madeira hydroelectric complex had already been decided: "President Lula has already taken the decision. There is no discussi on". BNDES planned to finance 30% to 40% of the Project.

In April, 2006, BNDES and the Inter-American Development Bank (BID) signed a partnership to finance large projects in the Amazon, among them the Madeira complex. The financing would be through a Conditional Credit Line Agreement for US$1.5 billion, to be managed and applied by BNDES. But, in December, 2006, the IDB under pressure from environmental organizations conditioned the financing to the results of studies on the project's socio-environmental impacts.

In May 2007, BNDES said it would be able to enter as a partner in the consortium that won the auction, in addition to financing up to 75% of the project, with reduced spreads.

Following the controversial granting of the environmental license, and the scheduling of the auction for the first dam, Santo Antonio, for October 30, the processes of structuring financial operations, principally for project financing, are at full-steam, and new consortia and potential investors are presenting themselves as interested in assuming these risks, or perhaps they don't even know what these risks involve.

Public Banks, such as the European Investment Bank, which already has Odebrecht among its Brazilian clients, as well as the World Bank and the IDB, must meet certain safeguards and considerations concerning the socio-environmental risks that should be considered in the financing of such projects with enormous impacts on the Amazon region.

Large private banks, such as Spain's Santander, and Portugal's Banif are considered the most probable financial advisors for the consortium led by Odebrecht. However, banks which have signed the Equator Principles will likely decline the project, given that it clearly does not meet various guidelines demanded by this voluntary set of standards.

Date and source of cost estimates	U$D Billions	R$ Billions (considering exchange rates of the period)
BNDES August 2003	5,251	15,227
Ministry of Planning July 2005	6,200	15,190
Furnas February 2006	9,340	21,700
Excelência Energética Consultancy May 2006	10,004	21,700
ANEEL april 2007	12,600	25,720

TAKING ACTION

Lúcia Ortiz

Riverbank dwellers, Indigenous peoples, social movements and civil society groups protest against hydroelectric dams on Madeira River, may 2006.

NGOs:

Influence public opinion and that of decision makers within the governments and financial institutions of your country, to oppose the Madeira River mega projects. Send letters to the governments of Brazil and Bolivia.

Politicians and decision makers:

Position yourself so that your government or institution is not involved in the destruction of the Amazon.

Financial institutions:

When making responsible decisions, consider the major social and environmental risks of the projects proposed for the Madeira River.

Movements, networks, organizations and communities that oppose the hydroelectric dams on the Madeira River:

Brazil: Fórum Brasileiro de ONGs e Movimentos Sociais para o Meio Ambiente e o Desenvolvimento – FBOMS; Rede Brasil sobre Instituições Financeiras Multilaterais; Movimento dos Atingidos por Barragens – MAB; Rede Brasileira pela Integração dos Povos – REBRIP;Via Campesina; Conselho Nacional dos Seringueiros – CNS; Comunidade da Cachoeira de Santo Antônio; Associação de Pescadores de São Carlos; Associação Arirambas; Instituto Madeira Vivo – IMV; Associação dos Amigos da Estrada de Ferro Madeira-Mamoré; Fórum de Debates de Energia de Rondônia – FOREN; Faculdade Católica de Rondônia; Comissão de Justiça e Paz-Arquidiocese de Porto Velho; Comissão de Justiça e Paz –Zona leste Sindicato Nacional dos Docentes do Ensino Superior-ANDES-SN-Regional Norte 1; Fórum Independente Popular do Madeira – FIPM; Associação Etno-Ambiental Kanindé; Associação Rio Terra; Rede de Educação Cidadã RO / AC; REAJA AC; Movimento Hip Hop da Floresta – MHF; Associação ADA AÇAÍ; Organização do Povo Indígena Parintintin do Amazonas – OPIPAM; Organização dos Povos Indígenas Gavião, Arara, Tupari, Aruá, Jabuti – PANDEREJ; Conselho Indigenista Missionário – CIMI; Organização dos Seringueiros de Rondônia – OSR; Associação dos Seringueiros do Baixo Rio Ouro Preto – ASAEX; ECOA-Ecologia e Ação-MS; Associação de Defesa do Meio Ambiente de Araucária - AMAR; Assembléia Permanente das Entidades em Defesa do Meio Ambiente – RJ; Associação dos Geógrafos Brasileiros; Bicuda Ecológica; Associação Gaúcha de Proteção ao Ambiente Natural – AGAPAN; Núcleo Amigos da Terra / Brasil; Instituto Centro de Vida – ICV; GT Ambiente AGB-Rio e AGB-Niterói; GT Energia do Fórum Brasileiro de ONGs e Movimentos Sociais para Meio Ambiente e Desenvolvimento; Brasil Democrático e Sustentável; Liga Ambiental – PR; Rede Social de Justiça e Direitos Humanos; Instituto de Estudos Socioeconômicos – INESC; Associação Terra Laranjeiras - ATLA; Amigos da Terra - Amazônia Brasileira; Associação de Proteção ao Meio Ambiente de Cianorte - APROMAC

Bolívia and Peru: Foro Boliviano sobre Medio Ambiente y Desarrollo – FOBOMADE; Liga de Defensa del Medio Ambiente – LIDEMA; CIEMAP / LIDEMA / Herencia; Central Indígena de Mujeres de la Amazonia de Pando - CIMAP; Federación Sindical Única de Trabajadores Campesinos de Vaca Diez; Comunidad Campesina San Pedro; Central Porvenir; Comunidad San Roque; Central Sindical Unica de Trabajadores Campesinos de Guayaramerín; Federación Sindical Unica de Trabajadores Campesinos de Pando; Federación Sindical Unica de Trabajadores Campesinos Regional Madre de Dios; Comunidad Villa Alidita; Comunidad Las Palmeras; Federación Sindical Unica de Trabajadores Campesinos Regional Vaca Diez; Comunidad Puerto Coimbra; Comunidad Campo Central; Comunidad Tumichuma; Comunidad Loma Alta; Comunidad Frontera; Comunidad 26 de Octubre; Comunidad Rosario; Comunidad Sindical Agraria Campesina Consuelo del Rosario; CER-DET Amigos de la Tierra Bolivia

International: Banktrack Network; Amigos de la Tierra América latina y Caribe; Fundación PROTEGER; Comité Argentino de la UICN; Friends of the Earth Melbourne; Probe Internationa; Programa Chile Sustentable; Federación de Organizaciones Conservacionistas de Costa Rica - FECON; COECOCeiba – Amigos de la Tierra Costa Rica; RED LAR Ecuador; Coalicion Anti Represas en los Rios Torola y Lempa CARTYL; KoBra – Kooperation Brasilien e. V.; Comenius Institut; La Organizacion Fraternal Negra Hondureña – OFRANEH; Environment Support Group; Amici della Terra Italia; Peoples Communications Centre (Malaysia); Coalición de Organizaciones Mexicanas por el Derecho al Água; Comité ProDefensa de Arcediano AC; Educación para la Paz A.C. - EDUPAZ; Instituto Mexicano para el Desarrollo Comunitario A.C. - IMDEC; Movimiento Mexicano de Afectados por las Presas y en Defensa de los Ríos ; Prodefensa del Nazas, A.C.; Both ENDS; Norges Naturvernforbund / Friends of the Earth Norway; Center for Environmental Law and Community Rights Inc.; Friends of the Earth-Papua New Guinea; SOBREVIVENCIA, Amigos de la Tierra Paraguay; Cordillera Peoples Alliance; Ecologistas en Acción; Friends of the Earth England, Wales, and Northern Ireland; The Corner House; Environmental Defense; Friends of the Earth United States; International Rivers Network; Global Response; Rainforest Action Group for Indigenous Peoples; Sustainable Energy and Economy Network - SEEN

Ribeirão rapids in Madeira River, possible location of a binational hydroelectric.
Pictures: Glenn Switkes

Civil society groups protest against hydroelectric dams on Madeira River, may 2006.

Jirau rapids with fallen trunks
Picture: Glenn Switkes

Madeira River: the second largest river in Amazonia
Picture: Lúcia Ortiz

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