

## Fact sheet: The Madeira Dam Complex

Madeira River Complex - an enormous mega-project including the construction of four hydroelectric dams, extensive river dredging and opening of channels - is currently underway in Brazil's western Amazon. The Complex threatens the ecological stability of the entire Madeira River and the livelihoods of local communities. The Madeira River Complex is part of two larger initiatives: the Integrated Regional Infrastructure for South America (IIRSA) - an effort by the national governments to construct a new infrastructure network for the region - and the Accelerated Growth Programme (PAC) - the flagship 'development' programme of Brazil's President Lula.

Despite being publicly promoted as a hydroelectric project necessary for Brazil to meet its increasing energy demand, the underlying justification for the Madeira River Complex is that it will promote raw material export, particularly soybeans, timber and minerals. Through the installation of navigation locks, and dredging to open the river channel, the Madeira River Complex will connect the western part of Brazil with highways being built in the Peruvian and Bolivian Amazon to the Pacific, facilitating the export of raw materials to Asia and North America.

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### 1. PROJECT BACKGROUND

The construction of the two main dams of the Madeira project - the Jirau and the Santo Antônio dams - is currently underway, with a planned start of operation in 2012. The Madeira River Complex was initially conceived in the early 2000s by the energy company Furnas Centrais Elétricas S.A. and the construction company Norberto Odebrecht S.A., soon after Brazil experienced a major

energy crisis in which the country's electricity system suffered severe shortages. Furnas and Odebrecht prepared an environmental impact assessment (EIA), which was submitted to the Brazilian environmental protection agency IBAMA, the government body that has jurisdiction for licensing projects of the scale of the Madeira River Complex.

In March 2007, IBAMA questioned the environmental feasibility of the Madeira project and decided that they had insufficient data from the EIA to be able to issue an environmental license. The body demanded detailed responses from the project proponents regarding what the agency considered the most critical issues, including the need to carry out a new, more comprehensive environmental impact study in domestic and cross-border areas.

### Flaws in the Environmental Study

Scientists made observations about the EIA showing that the area to be flooded by the Jirau Dam would be much larger than suggested, leading to a decrease in biodiversity and an increase in methane gas released from the flooded forest. The EIA subsequently dismissed Brazilian environmental legislation (CONAMA Resolution 01 / 86), according to which the limits of the geographical area to be directly or indirectly affected by a project must be defined.

The EIA also underestimated changes to the velocity of the river and tributaries, suggesting an underestimation of the amount of sedimentation that will build up by the Santo Antônio and Jirau dams. Higher sedimentation would extend beyond the area flooded by the dams, and could shorten the effective life of flora there. The dams would block the migration routes of important fish species, affecting the food security of indigenous peoples, farmers, and urban citizens who depend on the consumption of the Dourada and the Piramutaba, two of the staple fish species of the region.

### Environmental license

Despite the recommendations of IBAMA's technical team and its then-Licensing Director,



Photo Credit: Madeira

political authorities in Brazil pressured for approval of the Preliminary License for the two dams. This culminated with the President of IBAMA being replaced and the License Director resigning from his post. In July 2007, after months of deliberation, IBAMA approved the EIA for the Santo Antônio and Jirau dams. The environmental license was granted on the condition that 33 demands were met in relation to the construction and functioning of the two dams. Included in the demands were proposals for the construction of channels to allow for fish migration on the lateral sides of the dams, permanent monitoring of mercury levels and accumulation of sediments behind the dam propellers, and social support programmes for local riparian communities.

### The auctions

With the Preliminary License for the dams approved, the auctions for their concession were scheduled. In December 2007, the consortium led by the large construction company Construtora Norberto Odebrecht, the state-owned company Furnas Centrais Elétricas, engineering company Andrade Gutierrez Participações, mixed economy company Cemig and a financial fund made up of Santander and Banif banks won the bid for the construction of the Santo Antônio dam. Then, in May 2008, the Jirau dam was auctioned and the winning consortium included GDF Suez - the energy company partially owned by the French Government - Brazilian conglomerate Camargo Corrêa, and the

state-owned electricity companies Eletrosul and Chesf.

### Cross border impacts

Not only did the EIA underestimate the size of the area of influence of the Madeira Complex, but it also dismissed the potential impacts extending beyond Brazilian territory. Part of the watershed of the Madeira River is located in Bolivian and Peruvian territories. The projects are expected to have far-reaching environmental and social impacts beyond Brazil and into the tri-border region with Peru and Bolivia. The dismissal of cross-border impacts yielded a diplomatic crisis between Bolivia and Brazil. The Bolivian Government sent a number of official letters and statements to the Brazilian authorities, but none generated any effective response.

## 2. ENVIRONMENTAL IMPACTS

The Madeira is the largest tributary of the Amazon, representing 23 percent of all hydrological resources in the Amazon basin, and contributing 15 percent of the water volume and half of the sediments and nutrients that flow into the Amazon River and out into the Atlantic Ocean. The region is considered to be a "mega-biodiverse" home to an estimated 750 fish and 800 bird species<sup>1</sup>.

The construction of the dams is likely to change the water levels of the Madeira River during both the dry and rainy seasons<sup>2</sup>. This could potentially have an impact on lowland agriculture practiced by indigenous peoples and other traditional populations that live in the region. The construction of the dams is also likely to negatively impact fish stocks, affecting the local communities that depend on fish consumption as part of their diets.

In addition, the dams are expected to increase deforestation in the region, due to flooding and land speculation. Importantly, the two dams are also expected to increase emissions of greenhouse gases. Contrary to popular belief and to what is often promoted by Brazilian authorities and media, not only is hydroelectric energy socially 'dirty', as dams displace local communities and threaten the food supply of thousands of people, it is also 'dirty' in

environmental terms: CO2 is released in the atmosphere due to deforestation and burning, and methane is released from the reservoir, due to decomposing vegetation from the flooded forest.

Given that the Madeira Hydroelectric Complex is part of a larger initiative to build a new infrastructure network for the region to serve the export of raw materials, the environmental impacts of river traffic, port construction and the likely increase conversion of forest land to grain monocultures cannot be ignored. The environmental studies carried out before construction started, however, did not include any reference to the potential impacts of the waterway.

Another grave environmental concern of those who oppose the Madeira Complex is connected to the electricity transmission lines needed to transport the energy from the dams to far-away urban centres. It is estimated that a transmission corridor of at least 2,000km (1,242 miles) will need to be constructed. The substantial environmental impacts of such a transmission system were not considered in the environmental studies conducted before the project was approved.

### 3. SOCIAL IMPACTS

The Santo Antônio and Jirau dams are expected to cause extensive negative impacts on the region's local populations and ecosystems. Based on extensive experience with existing dams across the globe, the probable effects will include the permanent displacement of families and communities, the potential extinction of migratory fish species on which local communities depend, the increased spread of malaria, increased erosion of riverbanks, the loss of access to agriculture and forest extractive products, and stronger pressure on already lacking social services due to the migration of families in search of jobs. The contingent of people looking for worker who have flooded into the region is greater than the number of jobs created by the dam construction, overstressing the city of Porto Velho, the state capital, and contributing to problems commonly associated with the overpopulation of urban centres, such as violent crime.

The Instituto Madeira Vivo (The Living Madeira Institute) in the city of Porto Velho collected testimonies from local communities that demonstrate how the social implications of the dams' construction have not been properly addressed. Problems range from the lack of consultation with local communities to the inadequate provision of alternative housing, as conveyed in these statements:

"The company decides everything without asking people if that is what they want, and they are building houses made from thin metal sheets in the settlements."

"We only know that we will have to leave our homes, but we don't know what the compensation will be or if everyone will receive compensation."

"It is a model that does not work with the Amazon reality, because the region is very hot and will be unbearable to live in these houses, what's more, the quality (of houses) is not good at all and we don't want to live in those places."

"Dozens of these houses have fallen down, even before they've been occupied."

### 4. INDIGENOUS PEOPLES' RIGHTS

#### Lack of free, prior and informed consent

Different indigenous peoples live in the area where the Madeira Complex is being built. A number of documents, such as Brazil's Federal Constitution, the International Labour Organization's Convention No. 169 on the rights of Indigenous and Tribal Peoples, and the United Nations Declaration on the Rights of Indigenous Peoples stipulate that indigenous peoples must be adequately consulted before the implementation of any project that could negatively affect them. The companies involved in the Madeira Complex have failed to do so. As an example, the ESBR consortium responsible for building the Jirau dam, points to the inclusion of indigenous leaders in the opening panel of a public hearing on the construction as an indicator of "consultation" with the local indigenous communities. This sort of interaction does not comply with legal obligations to consult under Article 6 of ILO

Convention No. 169, nor does it constitute free, prior and informed consent.

## Isolated indigenous peoples

The National Indian Foundation (FUNAI), the governmental indigenous affairs department, has strong evidence that indigenous peoples in voluntary isolation live in the region of the Madeira Complex. These groups of traditional indigenous peoples reside in remote forest areas with little or no contact with the outside world. They depend on the forest and rivers for their sustenance and wellbeing, and are extremely vulnerable to disease—even simple colds can be deadly—because of their limited exposure to others over the generations. Several official documents confirm that FUNAI alerted IBAMA and the consortiums responsible for building the dams about the presence of these people in the area during the environmental studies. However, IBAMA and the two consortiums disregarded FUNAI's warnings.

In late 2009, an expedition led by FUNAI and the Brazilian NGO Kanindé, among others, confirmed the presence of four communities of isolated indigenous peoples in the area where the Madeira Complex is being constructed. The report issued by the expedition concluded that the groups are likely to have already fled their territory due to noise coming from the construction sites. As has frequently happened in the past, the contact between isolated indigenous peoples and outsiders could decimate the indigenous peoples because of their lack of immunological defences.

## 5. PROJECT FINANCE

In January 2007, Brazilian President Luiz Inácio Lula da Silva announced PAC Programme, the largest investment package to spur economic growth in Brazil in the past 40 years. Among the PAC projects, the Madeira Complex is one of the largest and most harmful development projects planned.

The projected costs of the two main dams of the Madeira Complex have risen substantially since the project was initially presented, from US\$5.5 billion to US\$12.6 billion - a 129% increase<sup>3</sup>. It is estimated that the energy generation costs of the Madeira Complex

will be among the highest in Brazil. None of these estimates, nevertheless, include the costs of constructing the transmission corridor needed to transport the energy that will be generated by the two dams to the centres of consumption. These transmission lines will be more than 2,000 km (1,242 miles) long. Projected costs of the transmission corridor have also increased substantially since they were first announced. Given the amplitude of the Madeira Complex in terms of engineering, with exceptional and unparalleled implications for the surrounding eco-system, construction costs could rise even more. In light of this scenario of engineering uncertainties and high energy costs, many sectors of society have asked who would be willing to invest in the Complex. A look at the companies that comprise the consortiums responsible for building the two dams in the Madeira quickly reveals the strong presence of public funds in the project, with state-owned companies such as Furnas Centrais Elétricas and Eletrosul directly involved.

Moreover, Brazil's Economic and Social Development Bank, BNDES, has approved R\$7.2 billion in financing to build the Jirau dam, while the Santo Antônio dam will receive R\$6.1 billion. Clearly, without BNDES financing, the Madeira Complex would not be built, as the risks and enormous costs of the project would not attract sufficient investment from private institutions. Founded in 1952 to support the country's industrialization process and plan long term development, BNDES, a public bank, has become one of the largest financial institutions in the world over the past years. Using subsidized funds, it finances both public and private companies, including multinationals. BNDES is currently present in almost every large business negotiation in Brazil and critics have stated that the institution is working as if its resources were unlimited. In the case of the Madeira Complex, as well as in many other operations, BNDES has committed to use public funds to finance a highly costly project of unprecedented scale. The investment risks, therefore, have been placed on the shoulders of the Brazilian taxpayer.

The Madeira Complex is also part of IIRSA, the ambitious plan to integrate the South

American continent via investments in highway construction, widespread river dredging, dams and other mega-projects. The initiative will connect areas containing natural resources (such as timber) and agricultural regions (such large-scale soybean farms) with ports in metropolitan areas, facilitating transportation of raw materials to the world's largest markets. The IIRSA initiative has received technical and financial support from the Andean Development Corporation, the Inter-American Development Bank, the United Nations Development Programme, and others.

## 6. PROJECT MONITORING

### Illegal deforestation

In February 2009, Energia Sustentável do Brasil (ESBR), the consortium responsible for building the Jirau Dam, was fined twice by the Brazilian environmental agency IBAMA for serious violations of environmental law. Both cases involved illegal deforestation. The consortium considered the violations as a 'misunderstanding', having appealed against the payment of both fines. The Superintendent of IBAMA decided against the consortium in both cases, maintaining the fines. The two fines, which total R\$ 1,375.000 (roughly US\$ 784,000), remain unpaid.

### Labor conditions

In September 2009, Brazilian authorities found 38 people working in slave-like labour conditions in the construction site of Vila Mutum, the transfer site for families when flooding begins from the Jirau Dam. As it is common in situations of this type, workers had come from a distant location, and had been attracted by promises of high salaries. The Brazilian authorities found the workers living in subhuman conditions, in an overcrowded wooden shelter, where they had no beds. The shelter had no adequate electricity or sanitary facilities<sup>4</sup>.

In early 2010, Brazilian authorities also reported finding inadequate working conditions in a construction site for the Santo Antônio dam. The construction site, responsible for clearing forest areas that will be flooded by the dam, was suspended for two months due

to a number of violations. Problems ranged from inadequate sanitary facilities and poor food provision, to lack of appropriate medical care and uninhabitable shelters, among other things<sup>5</sup>. In June, workers involved in the construction of the Santo Antônio dam broke silence and reported further abusive labour conditions they are being subjected to<sup>6</sup>. Workers reported the frequent occurrence of accidents (some culminating in the death of workers), which are covered up by the Santo Antônio consortium under the leadership of the construction company Odebrecht. These accidents are often caused by lack of training and the very intense work pace imposed by managers.

### GDF Suez

French company GDF Suez is the main target of a campaign led by an international coalition of civil society organizations from Brazil, Europe and the United States. As the majority stakeholder in the dam-building consortium ESBR (Jirau dam), the coalition identifies GDF Suez as directly responsible for the serious social and environmental impacts and risks related to the dam.

In early 2010, the coalition of civil society organizations sent a letter to Mr. Gérard Mestrallet, the President of GDF Suez criticizing the company for its involvement in the construction of the Jirau Dam. The letter was also sent to French President Nicolas Sarkozy and other authorities in the French government, as GDF Suez is owned in part by the government. The coalition called on GDF Suez to immediately suspend all activities related to construction of the Jirau Dam on the Madeira River.

GDF Suez was nominated to the 2010 Public Eye Awards, a critical counterpoint to the annual meeting of the World Economic Forum in Davos. The Awards' aim is to remind "the players of the global economy who impact people and the environment with destructive business practices that actions have consequences – in this case for the image of the company". GDF Suez was shortlisted for the Global Award.

# Photos courtesy of Amazon Watch, International Rivers and the Rainforest Foundation UK

1 International Rivers Network, [www.irn.org](http://www.irn.org)

2 Jorge Molina Carpio, "Análisis de Los Estudios de Impacto Ambiental del Complejo Hidroeléctrico del Río Madeira — Hidrología y Sedimentos," April, 2006, [www.fobomade.org.bo/rio\\_madeira/doc/analisis\\_madera\\_.pdf](http://www.fobomade.org.bo/rio_madeira/doc/analisis_madera_.pdf).

3 Switkes, G. (Org.) Muddy Waters – Consequences of damming the Amazon's principal tributary. International Rivers, <http://www.internationalrivers.org/en/latin-america/iirsa/muddy-waters-impacts-damming-amazons-principal-tributary>

4 Repórter Brasil. Trabalho escravo é encontrado em obra ligada à usina do Madeira, <http://www.reporterbrasil.org.br/exibe.php?id=1664>

5 Repórter Brasil. Usinas do Madeira: novos problemas trabalhistas, <http://www.reporterbrasil.org.br/exibe.php?id=1744>

6 Brasil de Fato. Superexploração de trabalhadores na maior obra do PAC, <http://www.brasildefato.com.br/v01/agencia/nacional/super-exploracao-dos-trabalhadores-na-maior-obra-do-pac/view>

