

Ocekadi: Hydroelectric Dams, Socio-Environmental Conflicts, and Resistance in the Tapajós Basin¹

Executive Summary



This book aims to deepen the public debate around an unprecedented series of hydroelectric dams that are currently planned, in construction, or already on line in the Tapajós River basin. The Tapajós River basin is a region of enormous social and biological diversity that stretches through the Brazilian states of Pará, Mato Grosso, and Amazonas, linking two great biomes: the Cerrado scrubland biome and the Amazon biome. In particular, the book addresses issues related to socio-environmental conflicts, as well as incompatibilities between public policies (stemming from a centralized, authoritarian model and implementation of large-scale enterprises, conducted by the electrical sector and private industries) and resistance movements initiated by indigenous peoples and other groups advocating for defense of their territories and livelihoods.

This publication brings together 25 articles, produced by researchers connected to different Brazilian and foreign institutions, as well as individuals from public agencies, non-governmental organizations, and social movements that are operating in the Tapajós basin or in other Amazonian areas also impacted by the proliferation of dams. The book comprises unpublished texts or, when noted, published articles that have been adapted. What follows is a summary of the principal arguments set forth in the articles, which outline in a detailed and comprehensive manner fundamental aspects of the planning, environmental licensing, and construction of hydroelectric dams in the Tapajós basin. Moreover, at various points the articles draw comparisons with similar experiences, for example, the Belo Monte hydroelectric complex in the Xingu River basin. Particular emphasis is put on questions related to the scale of socio-environmental impacts and risks; the legal framework for human rights and environmental protection; and compatibility with other public policies, including sector-specific and regional policies. At the same time, the articles offer empirically-based predictions in the event that numerous hydroelectric dam projects (UHEs) and small hydroelectric plants (SHPs) will continue to move forward.

Mauricio Torres, in his article **“A River of Many People: The Shared Struggle of Plural Lives in the Valley of the Upper Tapajós River Basin,”** addresses the history of the occupation of the

¹ *Ocekadi*, a term from the Mundurucu language, can be translated as “our river” or “the river of our place”

upper Tapajós River basin. He explores the social diversity of this region and the repeated attempts, on the part of successive governments, to render invisible the indigenous peoples, riverside communities, peasants, and other populations that live there—with the objective of opening the territory to indiscriminate economic exploitation. According to the author, “the narrative tells us that the region is empty, in an attempt to ‘justify’ the territorial expropriation and the undermining of these groups’ ways of living.” When denying their presence isn’t possible, they are “relegated to the condition of an ‘obstacle’ to be removed to clear the way for the interests of agribusiness, hydropower, and mining companies.” Having lived through various different economic periods (including the rubber extraction, the extraction of large felines’ fur, gold mining, as well as the military dictatorship’s ‘development’ projects), indigenous peoples, traditional riverside communities, and rural workers find themselves now facing the approval of hydroelectric projects in the river basin. At least three indigenous territories’ declaration processes have been dismissed [which would have demarcated the land as protected], and an extractive reserve, Resex, had its creation halted, since these were considered obstacles to the establishment of hydroelectric expansion in the river basin. The article also discusses the current political alignment of indigenous and riverbank peoples in the struggles for recognition of both their territories and their identities.

Ricardo Scoles, in his article **“Environmental Characterization in the Tapajós Basin,”** synthesizes data on the Tapajós River and its tributaries—such as the Jamaxim, the Teles Pires, and the Juruena Rivers—detailing impacts that the planned dams can cause, including cumulative impacts. There are strong indications that biological diversity and endemism (occurrence of species with distribution restricted to one eco-region) may be higher in the southern part of the basin—just where the highest concentration of planned dams is located.

As the author notes, our knowledge of the basin’s biodiversity, especially in the southern part, is still minimal. Among the historical socio-environmental problems related to the basin, Scoles emphasizes the contamination of water with mercury; the livestock industry’s expansion in Mato Grosso state; and, in the Pará state portion, the territorial advances of miners and the intense rise in illegal extraction of wood. However, he underlines the hydroelectric expansion in the basin, which involves “interferences, of as yet undetermined scope, with the flux and cycles of the river water, which are responsible for the dynamism in the ecology of the areas of seasonally flooded forests, biological diversity, large scale migrations, and reproduction cycles of aquatic fauna.” This is, “without a doubt, an ecological threat with far-reaching consequences.”

“‘Exit for the North’: The Articulation of Infrastructure Projects and Logistical Routes in the Tapajós Basin,” by Daniela Fernandes Alarcon, Natalia Ribas Guerrero, and Mauricio Torres, discusses the negative consequences of the articulation of the dam projects with other infrastructure projects projected or in construction in the Tapajós basin. More specifically, they address implementation plans for the Teles Pires-Juruena-Tapajós hydroelectric plant; the construction of ports in the municipalities of Itaituba and Santarém (Pará state); the paving of the Cuiabá-Santarém road (BR-163); and mining pressures on the basin, a location which is one of the richest gold mining provinces on the planet. According to the authors, such interventions—which respond to pressures of certain economic sectors, notably agribusiness, dedicated to the constitution of a new logistical axis for the outflow of commodities—compete for the “intensification of economic activities which are frequently predatory and illegal, threatening the life ways and integrity of indigenous territories, traditional riverside communities, and rural workers, among other groups.” “Historical tendencies [in the region] therefore are perpetuated—

it's easy to find precedents for this development option, frequently sold as 'innovative,' in the military dictatorship's interventions carried out in the Amazon basin, with a host of damaging outcomes that persist today," the authors conclude.

The effects of the conjunction of hydroelectric dam projects (UHEs) and small hydroelectric plants (SHPs) and of the Teles Pires-Juruena-Tapajós hydroelectric plant are examined by Philip Fearnside in the article **"The Plans for Hydroelectric Plants and Waterway Construction in the Tapajós Basin: A Compounding of Negative Impacts."** As the researcher indicates, "the conjunction of impacts of many dams and of the waterway on the Tapajós River, including its tributaries, is much greater than the damages that generally enter the conversation when any particular works project is debated." The establishment of the Tapajós waterway, the author points out, will incentivize deforestation for the purpose of soy cultivation in the northern part of Mato Grosso state, similar to grain cultivation in areas that are today covered with pastures, indirectly provoking deforestation in other areas. The dams associated with the waterway, he emphasizes, already come with intense impacts on the area's indigenous territories. Despite this, the federal government has ducked the debate. "To omit discussion on the most controversial components of plans for hydroelectricity represents a general pattern, repeating the recent history of licensing of the Santo Antônio and Jirau dams, on the Madeira River, and Belo Monte, on the Xingu River." It's worth noting that the Ten-Year Plans for Energy Expansion (PDEs) have prioritized the dams that compose the hidrovía. Three of the five dams necessary for the construction of the branch that would make the Teles Pires River navigable up into the north of Mato Grosso state are already under construction.

"Tapajós: From River to Electrical Current," by Wilson Cabral de Sousa Júnior, discusses the necessity and the technical and economic viability of hydroelectric expansion projects in the Amazon. The author emphasizes, among other concerns, the enormous inefficiency in energy use in Brazil; the impacts of development schemes that are anchored in energy-intensive products of low aggregate value, such as mining and agricultural products; and the unreliability of official projections, which frequently overstate future energy demands. According to Cabral, government cost-benefit analyses of these projects have been biased, usually serving powerful private interests. The low quality of viability studies leads to inefficient (or even ineffective) investments and to rising social costs. The Tapajós hydroelectric complex, composed of seven hydropower plants (HPPs) on the Tapajós and Jamanxim Rivers would be unsustainable (from the point of view of the corporation), both in the most optimistic scenario (generating a loss of around US\$ 1.6 billion), as well a more realistic scenario (generating a loss of around \$10 billion). In both scenarios, the socio-environmental costs of the enterprises will reach around \$400 million. Given this framework, Cabral argues that it will be essential to carry out actions to make Brazil's use electricity more sustainable, investing in efficiency increases and in the expansion of offerings of wind and solar power.

"Basin Inventory Studies: Characteristics of an Initial and Decisive Phase in Hydroelectric Dam Planning on the Tapajós River," by Brent Millikan, analyzes the inventory studies and "integrated environmental assessments" (*Avaliações Ambientais Integradas - AAIs*) carried by the government's electrical energy sector, in conjunction with private companies for the Tapajós-Jamanxim, Teles Pires, and Juruena sub-basins. Such studies, it is argued, have been characterized by a series of limitations, including underestimation of socio-environmental

impacts, disregard for incompatibilities between proposed dam projects and other territorial policies, and lack of space for citizen participation in decision making. More specifically, such studies have underestimated the importance of seasonal flood pulses in rivers and associated ecosystems, complex relationships between populations and territories, and traditional knowledge of such interrelations. The author notes that no comprehensive analysis of cumulative and synergistic impacts of proposed projects within the Tapajós basin as a whole has yet been carried out, in contrast to requirements of Brazil's environmental legislation. Indeed, existing studies have segmented the Tapajós basin into sub-basins and even particular stretches of river. "In the AAIs, we see a lack of logical consistency between the initial diagnosis of ecosystem fragility and socio-environmental conflicts, and the report's final chapters on guideline (for the electrical sector) and recommendations (for other sectors)." The state energy company Eletrobras has pressured consultants to alter or suppress critical elements of their reports. None of the AAIs carried in the Tapajós basin has recommended a vetting of projects previously selected in the basin inventories, which raises serious questions regarding its usefulness as a planning tool.

Ricardo Folhes, drawing from his experience as advisor to Brazil's National Indian Foundation (FUNAI), and, later, as a consultant with *Ecology Brasil* – the consulting firm contracted to conduct the Integrated Environmental Assessment (AAI) for Tapajós-Jamanxim sub-basin – reflects upon the environmental licensing process, especially with regard to the indigenous component of studies. In "**Bureaucratic Ritual of Territorial Occupation by the Electrical Sector: The Case of Integrated Environmental Assessments in the Tapajós Basin,**" Folhes describes the politics underlying environmental consultancy studies, in which his analysis of potential conflicts involving indigenous peoples, as part of the AAI, was subjected to alterations of meaning and deletions. He describes how he was pressured to focus on "positive impacts" of proposed dam projects and develop an analysis that would expedite their approval. While working for FUNAI, he was exposed to pressures of development agencies to obtain environmental licenses in the absence of due analysis of impacts and risks for indigenous peoples. According to Folhes, the AAI for the Tapajós-Jamanxim was based on a marked hierarchy of knowledge, in which physical science overshadowed social concerns. Folhes notes, "The concept of the neutral scientist, a positivist heritage, is strongly embedded in these studies." In this framework, he concludes, "the discourse of dam construction as Brazil's 'vocation' for developing its economy and energy sector, allied with claims to "sustainable development," would legitimize advances into territories occupied by indigenous peoples and other traditional populations.

The environmental licensing process for large infrastructure projects has been the target of many critics, according to Evandro Mateus Moretto, Carolina de Oliveira Jordão, Edilene Fernandes and João Andrade. In "**Environmental Constraints and Ecological Viability in the Environmental Licensing Process: An Analysis in the Case of the Teles Pires River,**" the authors observe that it's quite common for the dam industry to not properly implement its commitments to guarantee the environmental viability of its projects. With regards to the Teles Pires hydropower plant, the authors state, the environmental licensing process was marked by serious problems, notably, violations to indigenous rights. It is important to note that the enterprise destroyed the Seven Falls (*Sete Quedas*) waterfall, "an area of reproduction of migratory fish that are the basis of the indigenous populations' diet. Moreover, [the waterfall] has religious and cultural importance as a place sacred to the Munduruku, who believe that the

Mother of the Fish lives [in the waterfall].” This case, the authors conclude, illustrates a trend in Brazil’s environmental licensing process: the environmental viability of the projects has rested more and more on environmental stipulations and less on actual assessment of environmental viability, a crucial phrase in the decision-making process, in which alternative technologies and alternative locations must be considered—designed to prevent the establishment of projects which are unfeasible or even unviable.

In the article **“BNDES and the Financing of Dams in the Tapajós Basin,”** Biviany Rojas, Brent Millikan, and Daniela Fernandes Alarcon discuss the involvement of the National Bank for Economic and Social Development (BNDES) in hydroelectric production projects in the Amazon basin, considering the relations between the bank, civil society organizations and other persons involved in the processes, taking these into account when reviewing the analysis, approval, and contracting of loans, as well as the monitoring and inspection of the ventures. From January 2011 to July 2014, the BNDES loans for hydroelectric productions (AHEs) in the Tapajós basin totaled around R\$4,087 billion (US \$11.4 trillion). According to Rojas, Millikan, and Alarcon, the role of BNDES in relation to the Tapajós River dams, to a certain extent, is repeating what happened with the Belo Monte Dam. “The case of Belo Monte demonstrates clearly the impotence of the Socio-Environmental Responsibility Policy (PRSA) of BNDES, both in evaluating socio-environmental risks (avoiding slanting support to certain enterprises) as well as in efficiently tracking risk management and socio-environmental impacts involved in the projects the bank decides to support.” The bank, the authors emphasize, has been lenient and absent in the face of the industry’s failure to comply with conditions attached to the receipt of environmental licenses, as well as its disregard for human rights, contributing to aggravation of socio-environmental conflicts.

In **“The Press and Dams in the Tapajós Basin: Commitment to the Official Discourse and Suppression of Criticism,”** Daniela Fernandes Alarcon, Natalia Guerrero and Vinicius de Aguiar Furuie analyze journalistic coverage of the Tapajós basin dams, demonstrating how it has contributed to the spread of language constructions taken from official discourse—articulated in expressions such as “growth,” “development,” “national interest,” and “technology” —and contributed to the erasure of dissenting voices. Among the sources considered in their analysis were a daily newspaper with national circulation (*O Estado de São Paulo*), an outlet specializing in economic journalism (*Valor Econômico*), a news portal dedicated to the energy sector (*CanalEnergia*), and three journals with local distribution, based in Santarém (*Gazeta de Santarém*, *O Estado do Tapajós*, and *O Impacto*). In the materials they analyze, official sources dominate the discourse, while critical voices tend to be regarded as suspicious. The dams are commonly presented as inevitable and are not considered in light of past examples of UHEs that caused grave and irreversible socio-environmental damages. In the hegemonic journalistic coverage, indigenous peoples are frequently characterized as “obstacles” to development, at the same time that riverbank peoples and other affected peoples are usually rendered invisible. The authors conclude that therefore such outlets offer few contributions to the monitoring or the deepening of public debate on the subject.

In **“Suspension of Preliminary Injunction and Hydroelectric Plants: Flexibility in the Environmental Licensing Process in Judicial Proceedings,”** Rodrigo Oliveira and Flávia do Amaral Vieira demonstrate that the suspension of preliminary injunction and anticipatory

guardianship (SLAT) has been “a factor in procedural disequilibrium in favor of the State,” biasing the discussion on the hydroelectric projects’ legality, and promoting “confusion between collective interests and the State’s interests.” As of the time of the article’s writing in Nov. 2014, the Federal Public Ministry (MPF) had brought 14 lawsuits challenging the environmental licensing process of the UHEs planned in the Tapajós River basin. A dozen of them were given preliminary injunctions, with nine of them favorable to the MPF. Nevertheless, none of these decisions ended up being applied, as all of them were suspended. It’s important to note that the SLAT decisions will remain in effect until the final disposal of these proceedings; in effect, the construction projects have become *faits accomplis*. “These decisions assume that Brazil is experiencing a crisis in energy supply and, consequently, all the UHEs planned for the Tapajós basin are considered crucial for the national energy expansion,” the authors observe. “According to this rationale, as long as the energy crisis persists, the disrespect of the mandated environmental licensing process is legally authorized, and valid legal norms become ineffective. It amounts to a flexibility in the environmental licensing process in the courts, without the necessity of any legislative modification.”

Using a related approach, “**The Invocation of the ‘Suspension of Security’ Order: Fish out of Water Facing the Democratic Constitution,**” Flávia Baracho Trindade, Gustavo Godoi Ferreira, Heidi Amstalden Albertin, Luís Renato Vedovato, Marcelo Brandão Ceccarelli, Maria Carolina Gervásio Angelini, and Thaís Temer analyze the “political compromise” of the judiciary in the planning and licensing of the dams, focusing on the utilization of the legal instrument known as the Suspension of Security (SS). As the authors indicate, environmental licenses for infrastructure projects have been approved, disregarding the Brazilian legal code. Because of this, the Public Ministry has proposed lawsuits “with the objective of setting the brakes on violations to environmental law.” In some cases, court decisions were handed down that determined the suspension of the projects. Nevertheless, the federal government has enforced the SS in order to block such projects, “effectively holding it in force until the proceedings that are seeking to investigate the alleged violations end.” “Acting in this way, they seek to erect barriers, in what amounts to a breakdown in the guarantee of access to justice.” “The Judiciary’s commitment to a distinct public energy policy project” is therefore evident. The SS, the authors underline, is an unconstitutional instrument, which clashes with the international legal order and guarantees the supremacy of “financial sector and state interests, undermining protection of the environment and of indigenous people’s rights.”

The environmental licensing of the São Luiz do Tapajós hydropower plant was initiated without fulfillment of “free, prior, and informed consultation” (CLPI), as required under the International Labor Organization’s Convention 169. As early as 2013, pressured by the indigenous mobilization and legal decisions, the federal government began the consultation process, analyzed in the article “**The São Luiz do Tapajós Hydroelectric Plant and Prior Consultation of Indigenous Peoples and Traditional Peoples**” by Felício Pontes Júnior and Rodrigo Oliveira. As the authors demonstrate, the federal government’s stance in the initial phase of the proceeding prevented the consultation from being “free, prior, and informed,” and was neither culturally adequate nor conducted in good faith. When the pre-consultation meetings were held, the studies for the implementation of the hydropower plant had already been authorized. As soon as the proceedings began, the Operation Tapajós movement mobilized, which sought to guarantee that environmental hearings in indigenous territories would be held as required. Despite this,

government representatives acted to fragment the Munduruku people, disrespecting their organization and delegitimizing their chosen political representatives. In this way, Pontes Júnior and Oliveira emphasize, the federal government demonstrated that the decision to construct the São Luiz do Tapajós hydropower plant was taken independent of and irrespective of the consultation of indigenous peoples, with such consultation thus becoming a “mere administrative act to rubber stamp State decisions.”

The São Luiz do Tapajós hydropower plant case is an “unequivocal campaign for the *privatization of profits, and public ownership of losses*,” argues Luis de Camões Lima Boaventura in the article “**The São Luiz do Tapajós Hydroelectric Plant: The Flooding of the Munduruku Daje Kapap E’Ipi Indigenous Territory (TI) and the Burial of the Federal Constitution of 1988.**” Constructing such a dam on the river, when implemented, would inundate a significant portion of the Sawré Muybu (Daje Kapap E’Ipi) Indigenous Territory (TI), in clear violation of the Brazilian Federal Constitution. As the author demonstrates, in the environmental licensing process for the UHE, the federal government acted to effectively render invisible the existence of the Munduruku indigenous territory. The Detailed Report for the Identification and Demarcation (RCID) of this territory [running at 194 pages], had already been prepared [in 2013]. “However, in a clear disregard of the Constitution, FUNAI [Brazil’s National Foundation of the Indian, set up to advocate for indigenous peoples], admittedly pressured by other government sectors tied to the electrical and civil construction sectors, failed to fulfill its legal duty and refused to publish this RCID report” [for the legal demarcation of the Munduruku Sawré Muybu territory]. In this context, the Federal Public Ministry and the Munduruku have undertaken a number of initiatives, also discussed in the article. Mid-2014, the MPF proposed a Public Civil Lawsuit (ACP), requesting FUNAI and the Federal Union to fulfill their obligation in the demarcation of the Sawré Muybu indigenous territory. The proceeding received a favorable decision in the courts, but it was overturned by a SS (Suspension of Security) order. As 2014 closed, following parameters of the still-unpublished RCID, the Munduruku initiated the auto-demarcation of the Sawré Muybu Indigenous Territory, “an unprecedented undertaking that will certainly reshape the history of indigenous peoples and land structuring in Brazil.”

In “**A Note on the Geometry and System of the Munduruku Indigenous Numeration Approximation System with Respect to ILO Convention 169,**” Pierre Pica, Sidarta Ribeiro, Jairo Saw, and Mauricio Torres discuss relationships between unique characteristics of Munduruku conceptual systems and the right to “free, prior, and informed consultation” with respect to infrastructure ventures in the Tapajós basin. They cover fundamental milestones in the mobilization of the indigenous, such as the 2014 creation of a consultation protocol. According to the article, one can observe “a profound difference in cognitive architectures between this indigenous people and Western societies.” The authors analyze an image taken from the environmental impact report (RIMA) for the São Luiz do Tapajós hydropower plant, a document that would supposedly present the results of the environmental impact study (EIA) in the most accessible terms. However, the authors found 14 concepts (such as “surface,” “meters,” “millions,” and “gradient”) entirely absent from the Munduruku culture, as well as terms that are partially absent (such as “width,” and “right” [as a directional term], which, among the Munduruku, have different meanings). The article presents a warning: “The incredibly rich properties of the mental and social organization of the Munduruku represent in and of themselves a signal that should constitute a warning against destruction.

What's at stake is nothing less than the preservation of the diversity in human cognition which, apart from being a value in itself, could well be indispensable for the future and survival of our species."

"Dams and Violations of Indigenous Rights in the Juruena River Basin," by Andreia Fanzeres and Andrea Jakubaszko, offers a demonstration of the socio-diversity in the Juruena River Basin, along with the land-use and environmental pressures imposed by hydroelectric production projects on the indigenous peoples who live in the region, and irregularities that have marked the licensing of the enterprises. The article covers the dramatic situation of the Enawene Nawe, who, since 2008, have not been able to enact their principal ritual, the *Yaokwa*, characterized by collective fishing using weirs [stake enclosures set for fish] and by interaction with entities known as *yakairiti*. As a result of the Juruena hydroelectric complex, made up of a consortium of ten enterprises, the indigenous people now yield no fish, depending on buying chicken and frozen fish in order to hold their ritual. It is essential to note that the *Yaokwa* is officially recognized as a part Brazil's cultural patrimony as well as humanity's patrimony. The many people who live in the Juruena basin (the Apiaká, Bakairi, Kayabi, Myky/Irantxe, Munduruku, Nambikwara, Paresi, and Rikbaktsa peoples) also each have territories and life ways threatened by the dams. For example, the Manoki territory alone is affected by 11 small hydroelectric plants. As the authors indicate, the dams continue to sharpen previously existing pressures associated with predatory activities such as mineral and lumber extraction.

"We are the people who live on the rivers on which you want to construct dams," affirm indigenous, riverbank and fisher people in a letter reprinted by Helena Palmquist in **"The Government That Operates Like the Anaconda and the Munduruku Resistance to the Dams on the Tapajós River."** Taking as an initial milestone a 2011 protest by the Kayabi and Munduruku to demand the halt of the licensing of the São Manoel UHE, the article traces the strategies developed by indigenous peoples and traditional communities, focusing particularly on the Munduruku mobilization. As the author paints the picture, what emerges is the federal government's use of methods of repression. They underline the assassination of Adenilson Munduruku by the Federal Police (PF) during a police operation in the Teles Pires area in 2012, and the Operação Tapajós movement, which began in 2013. In this context, the environmental impact studies were conducted by researchers who had to be escorted by the military. There is clearly a systematic failure, on the part of official government bodies, to comply with the pertinent legislation or with commitments established with indigenous and traditional riverbank peoples. At the same time, the article highlights the vitality of the Munduruku mobilization, organized primarily with the Ipereg Ayu movement at its core. The indigenous peoples have employed tactics of direct action and legal appeals in a context where the balance of power is highly unfavorable.

The reduction of conservation areas (UCs) with the objective of making viable the hydroelectric complex intended to be implemented on the Tapajós and Jamanxim Rivers is analyzed by Maria Luíza Camargo and Mauricio Torres in the article **"Reduction by Order: Provisional Measure 558/2012 and the Arbitrariness of the Reduction of Conservation Areas in Amazônia."** In 2012, the reduction of the following areas occurred: portions of the National Park of Amazônia (Parque Nacional (Parna) da Amazônia), of the National Forests of Itaituba I, Itaituba II and Crepori (Florestas Nacionais (Flonas)), and of the Area of Environmental Protection of the

Tapajós (Área de Proteção Ambiental (APA) do Tapajós) were all reduced in 2012, “the mark of a hydroelectric expansion project that has not even concluded viability studies.” The measure was implemented without conducting any studies on its possible impacts on the species threatened by extinction or on archeological sites that are already registered, and without considering the dynamics of environmental degradation surrounding the UCs. According to the study from the Institute of Man and Environment in the Amazon (Imazon) referred to in the article, almost 80% of the areas excluded from the UCs are classified by the Environment Ministry (MMA) as an extremely high priority. After the reduction in protected areas, a part of the affected areas was taken over by illegal miners. It’s important to note that this was put into effect by provisional measure (MP), in clear violation of the Federal Constitution. For the authors, the reduction expresses the “strange, coercive harmony established between environmental and energy policies in Brazil.”

The concept of the “virgin forest,” called upon frequently by promoters of the dams in the Tapajós Basin, is a myth, Vinicius Honorato de Oliveira and Bruna Cigaran da Rocha indicate in **“Virgin Forest? The Long History of Human Settlement in the Tapajós Basin.”** The Amazon, they emphasize, has been modified by human action for centuries. Due to difficulties accessing the area, few archeological studies have been conducted in the upper reaches of the Tapajós River, in its headwaters and tributaries. They address key areas for understanding the Amazonian past, particularly the first millennia of occupation. “The humanized landscapes in the Tapajós basin represent layers of occupation and memory,” conclude Oliveira and Rocha. Beyond its scientific and artistic value for society in general, this patrimony holds great relevance for the indigenous peoples and traditional communities who live in the region. Such a patrimony, however, is threatened by the dams. In this light, the authors sound an alarm about the risks represented by the proposals on loosening protection of archeological patrimony in the environmental licensing process, as well as by the problems involved in operations of archeological “rescue” or “salvage.” Pulling artifacts out of their context and disregarding the knowledge of populations that live in the region, as well as their symbolic relationships with this patrimony, threaten research studies. They also amount to contemporary forms of expropriation of indigenous peoples and traditional communities.

“On Archeological Sites and Significant Places: Socio-Environmental Impacts and Violations of Cultural Rights of the Indigenous and Traditional Peoples by the Hydroelectric Plants in the Tapajós River Basin,” by Francisco Antonio Pugliese Jr. and Raoni Bernardo Maranhão Valle, discusses the destruction of the Seven Falls (Sete Quedas) waterfall on the Teles Pires River in order to clear room for a hydroelectric plant of the same name. As the authors indicate, this is a “sacred site and terrain with incalculable relevance for the Munduruku, Kayabi, and Apiaká peoples.” The destruction of this territorial boundary was the subject of the Federal Public Ministry’s Public Civil Lawsuits (ACPs). Nevertheless, while preliminary injunction decisions have suspended the licensing process and interrupted construction on different occasions, these decisions were voided in the courts and the waterfalls of Seven Falls (Sete Quedas) were dynamited. This case was not the exception: various places that are significant for the indigenous peoples and traditional communities have been impacted by infrastructure construction works. Archeological excavations, in the context of licensing of UHEs, frequently occur without the authorization of indigenous peoples or riverbank peoples. In the text’s conclusion, the removal of Munduruku and Kayabi funereal urns by the business

Documento, responsible for the archeological studies related to the Teles Pires UHE, was investigated by the Attorney General (Procuradoria da República) in Santarém. This case gives definitive evidence of the violations committed when archeology is conducted on a contract basis.

“Mining for Hydroelectricity: Impacts of Belo Monte in the City of Altamira and Sources of Reflection on the Tapajós Hydroelectric Complex,” by Eric Macedo, presents a dramatic illustration of the magnitude of the urban impacts resulting from the infrastructure enterprises in the Amazon. The author enumerates some of the transformations that have occurred in the city in the context of the implementation of the Belo Monte UHE. They underline the rise in population as a consequence of the influx of migrants, attracted by the construction sites, into the area; the rapid growth in rental prices and foodstuff prices, as well as other goods and services; the increased unreliability of public services; the significant growth in incidents related to drug trafficking, thefts, robberies, and sexual assaults—amplified by the press, thus raising residents’ intense sense of insecurity. According to Macedo, one can identify a marked “mismatch between the rhythm of the dam construction and actions taken for urban infrastructure and all types of compensation promised for the region” [as mitigation for population removals and other alterations]. These transformations conform to a pattern that can be extrapolated from the specific case of Belo Monte Dam. “What’s revealed in this pattern is an aspect of forecastability as to future consequences, which is urgent in this moment when large UHE projects are proliferating throughout the entire Amazon,” Macedo indicates, pointing to dam proposals in the Tapajós River basin as emblematic of this trend.

In **“Impacts of the Construction of Hydroelectric Plants on Aquatic Amazonian Turtles: An Overview of the Tapajós Hydroelectric Complex,”** Juarez Carlos Brito Pezzuti, Marcelo Derzi Vidal and Daniely Félix-Silva discuss potential negative impacts of dams projected for the Tapajós and Jamanxim Rivers on the Giant South American River Turtle (*tartaruga-da-Amazônia* or *Podocnemis expansa*) and on the Yellow-Spotted Sideneck Turtle (*Podocnemis unifilis*). The authors criticize the limitations of the environmental licensing processes for the dams. Among other consequences, the dams can provoke a reduction in fish stocks or even the local extinction of some species, as well as a demographic explosion in other species, causing a significant reduction in biodiversity. Also predicted is a diminution in the turtles’ sources of food, which will result in a loss of body mass in the turtles. In addition, environments of “critical importance” for reproduction, such as beaches and riverbanks used for laying eggs, will be modified or will disappear. It’s worth noting that the most important egg-laying in the basin is situated less than 63 miles (100 km) from the site planned for the construction of the São Luiz do Tapajós UHE. In the region influenced by the planned hydroelectric complex, the authors explain, 11 species of aquatic turtles live. “This signifies an elevated richness in species, a product of the great availability of distinct and well-conserved environments.” A variety of these sites are considered vulnerable – the Giant South American River Turtle, for example, is classified as critically threatened.

In the article **“Migrations of the Jaraqui and Tambaqui Fish in the Tapajós River and Their Relationships with Hydroelectric Dams,”** Ronaldo Barthem, Efreim Ferreira, and Michael Goulding discuss the two species (*Semaprochilodus* genus and *Colossoma macropomum*). According to the authors, egg reproduction and the reproducing fish’s access to egg-laying areas have been affected, potentially causing disappearance of migratory fish species in stretches of the

river that will become isolated [as a result of dam construction]. “Apparently, the tambaqui fish demonstrates a strong dependence on the connection between the river stretches that are directly upstream and downstream of the São Luiz waterfall, because the area where adult fish feed is upstream of the waterfall, while their nursery is downstream, and their breeding ground, located exactly in the waterfall. Nevertheless, it’s not possible to evaluate if the narrow area of forest flooded around the São Luiz waterfalls could feed the fish populations located above the dam in the case that this stretch is cut off by other UHEs, such as the Jatobá and the Chacorão.” As the authors remind us, fishing is a crucial activity in the Tapajós basin – serving both as subsistence and as a source of income, with key participation of migratory fish, which makes the São Luiz do Tapajós UHE and other such enterprises all the more concerning.

“Government Promises Vs. Reality: Consequence of the Expansion of Mega-Enterprises in the Southeast Amazon,” by Juan Doblás, analyzes the socio-environmental impacts of the paving of BR-163 (Cuiabá-Santarém) road, and of the construction of the Belo Monte UHE. Among these, it considers the effects of such impacts on the efficiency of the enterprises themselves, which, as a result of climatic feedback, may make them inoperable. The measures for prediction and mitigation of socio-environmental damages resulting from infrastructure enterprises have been ineffective, Doblás observes, stimulating the illegal extraction of forest resources. From 2011 to 2013, the amount of deforestation surrounding BR-163 Road jumped 250%. In 2012, the area surrounding Belo Monte Dam, occupying 23% of Pará state, constituted 56% of illegal logging in the entire state. The authors note that the hydroelectric complex itself contributed greatly to the consumption of wood. Since the enterprise wasted millions of cubic meters in logs, removed from the forest for installation of construction sites and reserves, enormous quantities of wood were bought, thus incentivizing a primarily illegal logging market. “The consequences of the establishment of the Tapajós hydroelectric complex necessarily will be similar to the case of the Xingu River basin [where Belo Monte is located]: land speculation in rural areas, which causes a jump in deforestation; forest degradation; and, finally, massive deforestation in municipalities affected by the hydroelectric plant construction.”

The Clean Development Mechanism (CDM) in the Kyoto Protocol grants carbon credits for UHE, based on the premise that the electricity generation for dams would involve minimal carbon emissions compared to the generation of energy from fossil fuels, and the premise that, without financing in the form of these carbon credits, the dam projects would not be constructed. Neither of those assumptions holds water, as Phillip M. Fearnside demonstrates in **“Carbon Credits for Hydroelectric Plants as a Source of Greenhouse Gas Emissions: The Example of the Teles Pires Hydroelectric Plant.”** Various scientific studies demonstrate that the dams in the Amazon basin, especially during the first ten years of operation, produce large quantities of greenhouse gases: methane (CH₄), carbon dioxide (CO₂), and nitrous oxide (N₂O). The Teles Pires project, however, has ignored such emissions. The UHE therefore “earns carbon credits without any true benefit for the climate.” In addition, when the dam project was considered for the carbon credits, it was already financed and under construction. Fearnside’s analysis calls attention to the contradiction between the Brazilian government’s stated concern for climate change, in contrast with Brazilian diplomats’ interventions, which have “been fundamental in the establishment and expansion of loopholes in regulation” of the awarding of carbon credits for UHEs.

Original Reference:

Ocekadi: hidrelétricas, conflitos socioambientais e resistência na Bacia do Tapajós / Daniela Fernandes Alarcon, Brent Millikan e Mauricio Torres, organizadores. Brasília, DF: International Rivers Brasil; Santarém, PA : Programa de Antropologia e Arqueologia da Universidade Federal do Oeste do Pará (UFOPA), 2016. 534 pp. ISBN 978-85-99214-04-6

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