Regional Projects Require Regional Planning:
Human Rights Impacts Arising from Infrastructure Projects

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I. INTRODUCTION

In the coming years, South America faces monumental developmental change. Land that now contains first-growth tropical forests, healthy rivers, and private homes is slated to be destroyed and replaced with dams, highways, and waterway transit channels. Propelling this change

are 335 projects centered on transportation, energy, and telecommunications, thrown together under one multilateral umbrella. Dubbed the Initiative for the Integration of Regional Infrastructure in South America (IIRSA), this megaproject groups the twelve countries of South America into eight regional "hubs." Each hub contains numerous individual infrastructure projects designed to transform the region by "[overcoming] formidable natural barriers like the Andes Mountains, the Amazon Rainforest, and the Orinoco river basin." The overall economic objective of these projects is to "foster the integration and development of [these] isolated sub-regions."

Promotion and funding for these projects has occurred at the macro-level, while planning—other than from a purely business perspective—

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2. IIRSA, What are the prospects of IIRSA's work?, http://www.iirsa.org/BancoConocimiento/F/fm_que_orientacion_tienen_los_trabajos/fm_que_orientacion_tienen_los_trabajos_ENG.asp?CodIdioma=ENG.

In agreement with the region’s geo-economic vision, the South American territory is organized into multinational strips that concentrate current and potential trade flows, and where an attempt is being made to establish a common minimum standard for infrastructure service quality in transport, energy and telecommunications to support specific productive activities in each Integration and Development Hub or strip.

Id.


6. See IIRSA, supra note 2 (“The provision of these infrastructure services aims to promote the development of business and productive chains with big economies of scale throughout these hubs, either for domestic consumption in the region or for export to global
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has tended to occur piecemeal, on a small-scale level. Thus, projects are viewed regionally in some respects but individually in others.\(^7\) This discontinuity in perspective sets the stage for a politically, environmentally, and socioeconomically disastrous outcome.\(^8\) Numerous other infrastructure projects in the region demonstrate the potential for human rights abuses, including violations of the rights of the right to life, health, adequate standard of living, and healthy environment, as well as the rights of indigenous peoples.\(^9\)

\(^7\) Power plant builder FURNAS describes the projects individually when discussing licensing but regionally when discussing the projects' scope; this position proves hard to reconcile. "Mariangela [Damberg], of FURNAS, affirms that currently, only licensing of the hydroelectric power stations is being discussed . . . . However, . . . FURNAS' headquarters in Rio de Janeiro . . . stated exactly the opposite: 'FURNAS participates in the Rio Madeira hydroelectric power project, an undertaking that aside from generating energy will enable navigation between Brazil, Bolivia, and Peru.'" Gustavo Faleiros, Furnas e Odebrecht ainda têm muito o que explicar sobre hidrelétricas no Rio Madeira [Furnas and Odebrecht Still Have a Lot to Explain About the Rio Madeira Projects], O Eco, July 20, 2006, http://www.riosvivos.org.br/canal.php?canal=318&mat-id=9330 (author's translation).

\(^8\) See FURNAS ET AL., ENVIRONMENTAL IMPACT ASSESSMENT [EIA]: HIERARCHY OF ENVIRONMENTAL IMPACTS (2005).

\(^9\) See, e.g., Letter from Movimento dos Atingidos por Barragens [MAB], Nat'l Secretariat, to Enrique V. Iglesias, President, Inter-Am. Dev. Bank (June 2, 2005) [hereinafter Cana Brava Letter] (requesting relief for forced relocation without just compensation or mitigation in Cana Brava, which infringed the right to adequate standard of living and the right to information), available at http://www.bicusa.org/Legacy/MAB_letter_Portuguese.pdf; JUSTIÇA GLOBAL ET AL., ATINGIDOS E BARRADOS: AS VIOLAÇÕES DE DIREITOS HUMANOS NA HIDRELÉTRICA CANDONGA [AFFECTED AND OBSTRUCTED: HUMAN RIGHTS VIOLATIONS FROM THE CANDONGA DAM] 69–76 (2004) (noting violations in Candonga of the ability to support an adequate standard of living in terms of housing location, habitability, accessibility, security of tenure, provision of services, and cultural adequacy, as well as the rights to public health, human dignity, subsistence work, and public participation); Agência de Informação Frei Tito para a América Latina, UHE Campos Novos—Impactos de vazamento são subestimados [Campos Novos Dam—Impacts of Flooding are Underestimated], July 8, 2006, http://www.rbrazil.org.br/content,0,0,1066,0,0.html [hereinafter Agência de Informação] (describing infringe-
Environmental impact assessments provide a means to anticipate and mitigate these harms, but current assessments are limited to sub-sectors of the full project area, leading to an incomplete picture of the damage that will result. The potential human rights violations and other harms arising from these projects, in and beyond the officially recognized areas, are actionable under both national and international law. As a result, ignoring the true scope of the project area in the planning phase will not preclude state responsibility in the long run.

Consequently, regional projects require regional planning to avoid potentially disastrous environmental and human rights abuses. Focusing on the Rio Madeira project in Brazil as a case study in the impacts of infrastructure projects, this Note identifies the harm anticipated from these projects and highlights the need for verification of official predictions of such harm. It then proceeds to a legal analysis, addressing the applicable international law, Brazilian law, and regional legal frameworks and outlining the negative legal consequences arising from inadequate impact assessments. In light of these negative legal implications, the Note concludes by illustrating the need to proceed with planning and implementation of these projects only under a comprehensive, regional lens.

10. See, e.g., Agência de Informação, supra note 9.
11. See id. The IIRSA Secretariat takes a hands-off approach to specific planning elements, making each country's national IIRSA coordinator the only potentially accountable actors in the planning realm of IIRSA. See Interview with Alejandra Radl, Secretariat staff, IIRSA, in Buenos Aires, Arg. (June 21, 2006) (emphasizing that IIRSA's role consists of coordination, facilitation, and planning in the broadest sense).
II. BACKGROUND

A. Initiative for the Integration of Regional Infrastructure in South America

In August 2000, the presidents of South America’s twelve countries created an initiative consisting of plans for infrastructure projects throughout South America. To execute the initiative, labeled IIRSA, those government heads placed the technical coordination and operation in the hands of three multilateral development banks—the Inter-American Development Bank (IDB), the Andean Development Corporation (CAF), and the Financial Fund for the Development of the Rio de la Plata Basin—forming the IIRSA Secretariat. National development banks like the Brazilian Development Bank (BNDES), as well as the private sector, emerged as sources of further financial support.

This endeavor conceived of a ten-year timeline (2000–2010) for outlining project plans. Presented with an opportunity for funding, the twelve countries of South America each submitted a wish list of projects for inclusion in the IIRSA initiative. Despite IIRSA’s goal of regional integration, the individual countries did not fully embrace the mindset of regionalism in creating these lists. Rather, many of these projects were “in fact old, unfinished national infrastructure projects . . . being integrated into the regional framework in the hopes of breathing new life into them.”

As expected from such a broad request for proposals, the development banks lacked sufficient capacity to fund all of the proposed projects. Charged with the task of narrowing the undertaking, government officials

12. See IIRSA, supra note 4.
15. INTERACTION, supra note 14, at 53.
16. Interview with Alejandra Radl, supra note 11.
17. BICECA, supra note 1 (“[E]ven the President of the IDB, Mr. Enrique Iglesias, admits that ‘excess liquidity’ is the force driving these huge infrastructure projects, not, as IIRSA coordinators would like one to believe, the . . . dream of a unified South America . . . . Therefore, while the IIRSA discourse is integrationist, its logic is mainly financial.”).
18. Id.
19. For instance, Argentina alone submitted approximately one hundred projects. Interview with Alejandra Radl, supra note 11.
established a portfolio of 335 projects. In this way, the government officials comprising IIRSA, overseen by the IIRSA Secretariat, had a hand in the process until the project selection stage. From the IIRSA Secretariat’s standpoint, responsibility for all subsequent aspects of the process, including environmental assessments, fell to the national coordinators individually, rather than to regional planners collectively. IIRSA thus plays no role in conducting environmental assessments.

B. The Peru-Brazil-Bolivia Hub

The Peru-Brazil-Bolivia hub exemplifies the scope of the transnational issues involved in the IIRSA development project. Among the 335 infrastructure projects that fall under the IIRSA umbrella, eighteen are classified as part of this hub. Estimated investment in these eighteen projects is $11.6 billion. Official state estimates of projected impacts, funded by the Brazilian state hydropower company FURNAS Centrais Elétricas S.A (FURNAS), identified over seventy adverse impacts from these eighteen projects: twenty-three were classified as “very high” adverse impact and thirteen as “high” adverse impact. These estimates classify only nine impacts as “beneficial,” demonstrating that the negative environmental and human impacts will far outweigh improvements such as increased jobs and economic prosperity. Illustrating the degree of environmental alteration involved in the projects, one Brazilian news bureau noted that at least fifteen “natural obstacles” would be removed in order to build the hydroelectric complex.

21. Interview with Alejandra Radl, supra note 11.
22. Id.
23. See IIRSA, What are the Characteristics of the IIRSA Project Portfolio?, supra note 6.
24. Id.
25. FURNAS ET AL., supra note 8.
26. Id.
The extent of the impact goes far beyond the natural environment and in many cases will be irreversible.28 According to one civil society group wary of the IIRSA projects,

[t]he combination of investment in highway construction, widespread dredging, and dams proposed under IIRSA, with significant private sector investments in resource extraction and large-scale agricultural production . . . will not only have direct effects on biodiversity conservation, but also disruptive indirect effects on the small farm and agricultural labor sectors. Historically, this has led to the displacement of rural and indigenous peoples, massive migration, and deforestation. All of these developments potentially undermine the viability of the region's small-farm sector, established parks, indigenous lands, and biodiversity reserves.29

Clearly presented in IIRSA's project plans for the Peru-Brazil-Bolivia Hub are the Rio Madeira Projects.30 Less clear is the interrelatedness of those projects' components. IIRSA describes the Rio Madeira Projects as three projects within the hub: the “Madeira River hydroelectric complex, including floodgates for navigation”; the “Bolivia-Brazil bi-national hydroelectric plant”; and the “[t]ransmission line between the two hydroelectric power plants on the Madeira River and the central system.”31

Breaking the complex down into smaller projects in this way has led to some confusion as to whether each project individually forms part of IIRSA.32 This classification will directly affect the scope of any environmental impact assessments. For example, if the project as a whole is classified as part of IIRSA, then the secretariat would presumably ensure that an assessment covering the entire project was completed before construction. However, if the projects are individually classified as part of IIRSA, the assessments conducted by the various agencies will only take account of the limited areas surrounding the individual projects. The former president of BNDES revealed the interconnected nature of the projects when he explained that

28. BICECA, supra note 1 (“The environmental, social, cultural, and economic impacts of these projects on such areas as the Andes piedmont, the Amazon Basin, Brazil's Mato Grosso and Pantanal, and the Paraguay and Paraná rivers will be significant, and in many cases, irreversible.”).
29. Id.
30. See IIRSA, supra note 20; IIRSA, supra note 2.
32. See infra note 35 and accompanying text.
The Madeira River Complex project includes two hydroelectric dams in Brazil; floodgates for making the river navigable, which will require the elimination of a zone of waterfalls that “interrupt” navigation; a hydroelectric dam on the Beni River in Bolivia; and ports for the Madeira-Gupore-Beni-Madre de Dios waterway in Brazil, Bolivia, and Peru.\footnote{ZIBECHI, supra note 3 (quoting Carlos Lessa, ex-president of the BNDES).}

The two hydroelectric dams are the Santo Antônio and Jirau dams, currently the subject of planning by FURNAS.\footnote{FURNAS, supra note 3, at 1.} These dams’ location in the same complex as the two other dams, floodgates, and ports suggests a need to evaluate impacts collectively in order to account for cumulative impacts.

While FURNAS initially denied to the author that the Madeira projects have anything to do with IIRSA, thus allowing FURNAS to plan each project individually, it later admitted more than just a coincidence in project plans.\footnote{Interview with Acyr Jorge Teixeira Gonçalves, Envtl. Advisor, and Maria do Carmo Reis Cavalcanti, Technical Advisor for Hydraulic Energy Generation, FURNAS, in Rio de Janeiro, Braz. (July 4, 2006).} Indeed, FURNAS provided an article it had published describing the Madeira project as “part of a broad regional development plan, known as [IIRSA], which combines the efforts of several South American governments.”\footnote{FURNAS, supra note 3.} Thus, it is clear that the Madeira projects form part of IIRSA.

### III. Applicable Legal Frameworks

#### A. International Law

International human rights law establishes numerous obligations that arise in the context of infrastructure projects like the Rio Madeira complex. Specifically, the Rio Madeira project may result in violations of the rights to life, health, adequate standard of living, and healthy environment, as well as the rights of indigenous peoples. Though not binding, the Universal Declaration of Human Rights (UDHR) uses compelling language to denounce basic human rights violations.\footnote{See, e.g., Universal Declaration of Human Rights arts. 3, 25, G.A. Res. 217A, at 71, U.N. GAOR, 3d Sess. 1st plen. mtg., U.N. Doc. A/810 (Dec. 12, 1948).} More importantly, most of the guarantees in the UDHR also appear in either the International Covenant on Civil and Political Rights (ICCPR) or the International Covenant on Economic, Social, and Cultural Rights

\footnote{33. ZIBECHI, supra note 3 (quoting Carlos Lessa, ex-president of the BNDES).}
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All twelve South American countries have ratified the ICCPR and the ICESCR.39

The Inter-American Court of Human Rights and Inter-American Commission on Human Rights have broadly interpreted the rights enshrined in these human rights covenants.40 Additionally, the Inter-American Court has made clear that state parties to the American Convention on Human Rights must uphold the Article 1(1) duty to respect and guarantee human rights contained in the American Declaration of the Rights and Duties of Man.41 In the past, this approach has led the Inter-American Court to recognize potential violations of rights to life, privacy, family, participation in government, and movement and residence, as well as freedoms of association, conscience, and religion.42 In addition, the Inter-American Court has recognized the possible intersection of these rights with those of indigenous peoples, despite the lack of explicit protection for indigenous peoples’ rights in its covenants.43

In Brazil specifically, the Inter-American Court held the state accountable for complicity in murder in several cases under right-to-life

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42. See Mayagna, 2001 Inter-Am. Ct. H.R. (ser. C) No. 79, ¶ 156 (“[Nicaragua breached a combination of these rights] by ignoring and rejecting the territorial claim of the Community and granting a logging concession within the traditional land of the Community without consulting the opinion of the Community.”).

43. Id.
claims. In these cases the Court established that the state breached its duty under the Convention’s right-to-life provisions by neglecting to prevent the murders, pass legislation, and prosecute the perpetrators of the crime to obtain compensation for the victims. Trying claims arising from forced relocation that led to a massacre in Rondônia, the Inter-American Court found that Brazil violated rights to life, humane treatment, and fair trial in connection with its duty to guarantee fundamental human rights. The Court additionally recognized forced relocation as the cause of a right-to-life violation.

While violations of rights to health, adequate standard of living, healthy environment, and the rights of indigenous peoples have not been litigated in Brazil, other cases demonstrate that the state may face liability for such abuses. The right to health shows potential as a means of recovery, as it exists in strict, definite terms. Article 12 of the ICESCR creates specific obligations on states with respect to infant mortality, environmental and industrial hygiene, diseases, and medical treatment. Thus, the ICESCR defines the content of the right to health in a way that encompasses specific elements of the right, enabling victims to prevail more easily under the right to health than under a more general right such as the right to life.

Although less circumscribed than the right to health, the right to an adequate standard of living provides a means for bringing claims when its deprivation is sufficiently severe. While Article 11 of the ICESCR does not explicitly define “adequate,” it does establish a minimum core obligation of “basic needs” that requires all states to recognize the right to adequate food, clothing, and housing. Therefore, when a state fails to provide these basic needs, those who are deprived have a valid fundamental human rights claim, essentially

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47. Id. ¶¶ 150, 170, 196, 198.
49. Id. art. 12(2).
employing the right to life to elevate the adequate-standard-of-living claim.

The right to water has been inferred from the language of both Article 25 of the UDHR and Article 11 of the ICESCR. While no specific "right to water" exists, it is "understood as part of the right to life, as a component of the right to health, and as part of the right to food." To date, plaintiffs have incorporated the right to water in the broader context of water contamination and pollution rather than claiming it as a distinct right. The Inter-American Court has demonstrated its willingness to recognize these violations as violations of the right to an adequate standard of living. The African Commission on Human and Peoples' Rights has displayed a similar propensity to recognize these violations, as has the European Court of Human Rights.

The right to a healthy environment, related to the adequate standard of living but conceived of as a separate right, has yet not achieved binding status in international law. Notably, in the Americas, since the end of 1999, several precedent-setting, nonpartisan case briefs (amicus curiae) presented before the Inter-American Court on Human Rights in Costa Rica and at the Inter-American Commission on Human Rights in Washington, D.C., have successfully influenced the Court and Commission to consider environmental degradation as a violation of human rights.

Numerous cases brought before international human rights tribunals illustrate the multiplicity of rights in indigenous peoples' claims, including rights to life, health, and property. Cases supporting indigenous peoples' rights in the Inter-American system include

55. See Nigeria Case, Case No. ACHPR/COMM/A044/1, Commc'n No. 155/96; Zander, 18 Eur. Ct. H.R. 175.
Mayagna\(^{58}\) in Nicaragua, Enxet-Lamenxay\(^{59}\) in Paraguay, and Lhaka Honhat in Argentina. In Mayagna, the Court recognized violations of property rights by upholding claims based on freedom of movement and residence.\(^{60}\) Enxet-Lamenxay and Lhaka Honat were resolved through friendly settlements recognizing rights to land.\(^{61}\)

**B. National Laws of Brazil**

International law is generally unavailable prior to the exhaustion of national legal remedies. While Brazil's legal system is well developed, it has not proven effective in averting human rights disasters\(^{62}\) and has fallen short of delivering human rights protection mandated by international and national law. As a result, most individuals suffering human rights abuses must resort to the international legal system for relief.

Brazil's federal legislation protects human rights implicated by IIRSA projects. Both the *Constituição Federal* (Federal Constitution), and licensing statutes emanating mainly from Brazil's Ministry of the Environment (MMA) and two of the ministry's organs, the National Environmental Council (CONAMA) and the National Environmental Agency (IBAMA), set forth provisions on human rights and environmental impact assessments.\(^{63}\) The Federal Constitution guarantees socioeconomic rights, including rights to health, work, and an adequate standard of living.\(^{64}\) The Constitution also sets forth law specifically related to environmental impact assessments (EIAs),\(^{65}\) requiring an environmental impact study prior to any activity that may potentially cause significant harm to the environment.\(^{66}\)

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62. See infra note 85 and accompanying text.
64. *Constituição Federal* [C.F.] [Federal Constitution] art. 6 (Braz.).
65. C.F. art. 225. See also JUSTIÇA GLOBAL ET. AL., supra note 9, at 72.
National legislation further guarantees rights to health,\(^6\)\(^7\) water,\(^6\)\(^8\) a healthy environment (through the right to life),\(^6\)\(^9\) and participation in public life.\(^70\)

CONAMA has also passed resolutions defining obligations under the EIAs for large public works projects, particularly those involving electricity generation.\(^71\) These regulations outline three steps of the licensing process: 1) **Licença Prévia**, which requires a showing of viability from economic and engineering standpoints, completion of the EIA and a Report of Environmental Impacts,\(^72\) and public hearings; 2) **Licença de Instalação**, which authorizes project implementation; and 3) **Licença de Operação**, which authorizes operation of the project after verification that the required studies provide the requested data.\(^73\) The regulations also provide for suspension or cancellation of environmental licensing in the event of violation of legal norms or conditions, omission or falsification of data relevant to obtaining a license, or serious risks to health or the environment.\(^74\)

IBAMA also has developed **Instrução Normativa N° 065**,\(^75\) which consists of regulations specific to licensing large infrastructure projects with multistate impacts, as well as gas and petroleum-related activities

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\(^6\) C.F. arts. 196–200.


\(^6\) C.F. arts. 196–200.

\(^6\) See Justiça Global et al., supra note 9, at 72.


\(^6\) See Justiça Global et al., supra note 9, at 72.

\(^7\) Resolução No. 006/87, of 16 December 1987, D.O.U. of 22.10.1987 (Brazil).


\(^7\) Resolução No. 237/97, supra note 73, art. 19.

on a continental scale.\textsuperscript{76} This legislation outlines four primary requirements: 1) Instauração do Processo, which requires an inventory to determine general project feasibility; 2) Licenciamento Prévia;\textsuperscript{77} (3) Licenciamento de Instalação;\textsuperscript{78} and 4) Licenciamento de Operação.\textsuperscript{79}

Thus, projects like the Rio Madeira dams are subject to CONAMA’s regulations governing large public works, as well as IBAMA’s licensing scheme for both large projects generally and power plants in particular. Obtaining the Licença Prévia is arguably the most crucial step under both schemes. In this stage the determination of viability takes into account initial, general feasibility studies, as well as detailed projections of impacts as indicated by the EIA, among other assessment tools.

Part of this phase entails presenting the impacts to the public at audiências públicas.\textsuperscript{80} At these public forums, legislators and government officials listen to comments from members of the public and decide whether and how to accommodate those concerns. Along with the EIAs, audiências públicas aim to resolve problems and minimize impacts prior to granting the Licença Prévia.\textsuperscript{81}

Although Brazil’s detailed national process aims to protect human rights by requiring extensive planning, EIAs, and public hearings, this system has not succeeded in avoiding failures, as evidenced by a significant human rights investigation conducted by the United Nations at a dam site in southern Brazil.\textsuperscript{82} As the following discussion indicates, by focusing only on local planning, Brazil’s national regulatory and planning scheme does not adequately protect human rights. A regional approach to planning would more effectively protect the human rights of the region’s inhabitants by enabling consideration of cumulative impacts that would otherwise remain undetected prior to construction.

\textsuperscript{76} IBAMA, Licenciamento Ambiental Federal [Federal Environmental Licensing], http://www.ibama.gov.br/lncenciamento/.

\textsuperscript{77} See supra note 71 and accompanying text. See also Resolução No. 237/97, arts. 1, 8, de 19 de dezembro de 1997, D.O.U. de 22.12.1997, (Brazil); C.F. art. 225.

\textsuperscript{78} See the legislation cited in note 77, supra.

\textsuperscript{79} Id.

\textsuperscript{80} For more on audiências públicas, see IBAMA, Licenciamento Ambiental Federal, http://www.ibama.gov.br/licenciamento/index.php.

\textsuperscript{81} See Instrução Normativa No. 065, art. 6, de 13 de abril de 2005, D.O.U. 27.04.2005 (Brazil).

\textsuperscript{82} See GTE-FBOMS, supra note 9, at 27.
IV. DOMESTIC DEFICIENCY AND A COUNTERVAILING TOOL

A. Domestic Deficiency: Failures of Brazil’s National System

State responsibility for legal violations arises from the actions of the state’s public officials, agents, and institutions. Notably, many energy companies like FURNAS are state-run, and in major projects “the Brazilian authorities appear to be on the side of the Consortium, as well as [that of] agents violating fundamental rights of citizens, ruining, instead of promoting, their prospects for a quality of life with dignity.” These infrastructure projects therefore involve state action, both through affirmative acts and the failure to protect fundamental rights.

Past dam projects, such as those in Barra Grande and Campos Novos, have demonstrated the ineffectiveness of Brazil’s regulatory and licensing process and the overall failure of the Brazilian government to protect its citizens’ rights. In Barra Grande in 2004, a network of NGOs in the Mata Atlântica region and the Federation of Ecologists of Santa Catarina prevailed in a civil action against IBAMA and the energy company Barra Grande Energy. The defendants were held liable for falsifying the EIA by neglecting to address four million hectares of the Mata Atlântica rainforest, including threatened ecosystems. The federal judge explained that the creation of a fraudulent EIA threatened the integrity of the licensing process:

Now, if the environmental licensing which resulted in the granting of the licença prévia and licença da instalação was premised on an environmental study that was not in compliance or was only formally compliant, the ENTIRE licensing process is completely vitiated, ... because the actual situation, which is

83. See supra note 44 and accompanying text.
84. Justiça Global et al., supra note 9, at 74 (author’s translation).
85. See sources cited supra note 9.
contrary [to the one portrayed in the EIA], was not held to strict compliance with the legal requirements and regulations.  

As a result of the Barra Grande case, the licensing process now requires government agencies and NGOs, as representatives of the affected population, to develop Terms of Agreement, which set forth detailed measures with which regulated entities and the government must comply to protect the public interest, human health, and the environment. Despite this step, police brutality against eight people in Barra Grande followed the decision in January 2005, and IBAMA still granted the Licensa da Operação for Barra Grande in July 2005 without resolving conflicts between the government and the affected population.

As political science professor Sergio Abranches noted, “[i]t is enough to take a superficial look at the legislation regulating environmental licensing and CONAMA rules to see that the majority of the procedures are not being complied with.” One reason for these violations is that the potential gain from investment outweighs the potential risk of punishment, leading developers and institutions to disregard existing regulations. “Investors can use inaccurate or distorted information because the penalty for doing so is minimal compared to the profits driving these projects.”

Unfortunately, Barra Grande is not an isolated example. In Campos Novos, construction of the dam began before licensing approval. A December 2005 UN human rights investigation in the Rio Uruguai basin,

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89. Ação Civil Pública, supra note 86 (emphasis in original) (author’s translation).
90. See, e.g., GTE-FBOMS, supra note 9, at 54.
91. Id. at 30.
92. Id. at 29.
94. Id. at 29. See also infra note 147 and accompanying text (noting IBAMA’s acknowledgment of the lack of effective deterrence).
96. GTE-FBOMS, supra note 9, at 26, 28.
where the Campos Novos project was built, revealed human rights violations as a result of arbitrary detention, political violence, defamation, and political persecution.\textsuperscript{97}

In the wake of devastation from past dam projects, in 1993 environmental law scholar John C. Tucker observed that "Brazil has recently made substantial efforts to strengthen its environmental protection, including the environmental provisions in the 1988 constitution, special constitutional and statutory protection for specific geographic areas in Brazil, and programs to strengthen environmental institutions and regulatory programs."\textsuperscript{98} Yet in the face of repeated violations arising from inadequately planned infrastructure projects like Barra Grande and Campos Novos, the government's efforts and commitment have proven insufficient. If history provides any indication of future government efforts, relying on the environmental evaluation process as it now stands will not protect human rights and the environment at the level required by national law.

B. A Countervailing Tool: The Environmental Impact Assessment

Although the outcome of past infrastructure projects suggests a need for a more robust environmental planning process, the environmental impact assessment is an existing tool that can prevent some of the negative impacts. The central objective of the EIA is to avoid detrimental or catastrophic effects of projects that might appear justifiable through an economic lens. The EIA holds a vital place in the legal and regulatory sphere because enforcement mechanisms for much of environmental law are weak. Unlike many other environmental regulatory tools, which either are too broad, theoretical, ambiguous, or in practice are disregarded, EIAs have come to be recognized as a prerequisite for project planning and implementation.\textsuperscript{99}

Structurally, the EIA is a hybrid of national, international, and project-specific legislation. While EIAs are not currently required under international law or custom, most states have domestic laws requiring them for major infrastructure projects.\textsuperscript{100} Moreover, the existence of a


\textsuperscript{98} Tucker, supra note 66, at 314 (citing C.F. art. 225).

\textsuperscript{99} See, e.g., supra note 88 and accompanying text.

global movement toward developing international standards for environmental impact assessments affirms the emerging importance of this subject in the international arena. Project-specific regulations pertaining to EIAs also establish the importance of EIAs on a local level.

Efforts to create regional EIAs have emerged in Europe and North America. In 1991, European countries drafted a regional EIA at the Espoo Convention, which entered into force in 1997. This agreement includes an obligation for each state party to perform EIAs at an early stage in the planning process and to notify and consult with other countries on all likely projects with potentially significant adverse impacts. Mexico, Canada, and the United States have initiated the Draft North American Agreement on Transboundary Environmental Impact Assessment, which establishes transboundary EIAs for projects throughout the continent. The objectives of the draft agreement are to "provide decisionmakers with information on transboundary environmental impacts so that they can be taken into account, and 'to provide a mechanism for potentially affected people and governments to participate in the process leading to a decision on the project.'"

Regardless of the source of the mandate for the EIA, the importance of conducting comprehensive impact assessments cannot be overstated. The purpose of an EIA compels its implementation in a way that accurately gauges impacts by identifying, predicting, evaluating, and mitigating physical, social, and other effects relevant to development proposals before principal decisions and commitments are made. Thus, to be effective, an EIA must include the entire impact-bearing area.

The EIA's diagnostic function is particularly important for effective protection against claims of injustice made prior to environmental damage or during the construction and operation phases. The EIA operates

101. See Tucker, supra note 66, at 314 ("The EIS requirement also coincides with international consensus that the EIS is an essential tool for environmental protection.").
105. Id. at 308 (citing Draft EIA Agreement).
107. Id. at 32 n.17.
as a preventive instrument by mandating disclosure of impacts before licensing. If the EIA is carried out in accordance with its purpose, “it would not be possible to license projects expected to cause environmental degradation in conflict with legal standards, unless suitable and effective means of mitigation could be identified and a compliance monitoring system instituted.” If the anticipated environmental impact were to exceed legal limits, the project would have to be rejected and the license withheld by the public agency. Whether Brazil will strictly enforce these standards for EIAs, however, is a separate inquiry.

For hydroelectric projects, the Brazilian government recognized the importance of an integrated approach to impact assessment in developing the Integrated Environmental Assessment (AAI) after the Barra Grande debacle. The Ministry of Mines and Energy explains that the objective of the AAI is to evaluate a river basin’s environmental condition as it would exist with the proposed developments, considering both cumulative and synergistic effects on natural resources and human populations, as well as actual and potential use of water resources in the present and future. In addition, the AAI takes into account biodiversity conservation, socioeconomic development, and the state’s national and international legal obligations in developing its energy production plans.

V. THE RIO MADEIRA CASE

Environmental regulation of infrastructure projects presents Brazil with a prime opportunity to uphold the provisions of its laws. As John C. Tucker notes:

A proposed waterway “improvement” project (the [Paraguay-Paraná] Hidrovia [transit-waterway]) could serve as a true test of

108. *Id.* at 45. In general, the objectives of EIAs are to assure explicit consideration of environmental concerns along with their incorporation into the decision-making process; to anticipate, avoid, minimize, or compensate for significant adverse physical, social, and other effects relevant to the development proposals; to protect the productivity and capacity of natural systems and of ecological processes in order to maintain their environmental function; to promote sustainable development; and to optimize use and management of resources. *Id.* at 28.

109. *Id.* at 45 (author’s translation).

110. *Id.* at 45–46.

111. Resolução No. 001/86, de 23 de janeiro de 1986, D.O.U. de 17.02.1986 (Brazil).

Brazil’s resolve to enforce its constitutional environmental provisions. The Brazilian Pantanal, one of the world’s largest wetlands, currently faces potential ecological disaster from this internationally sanctioned economic development project. The project is endorsed by several multilateral development banks, several foreign governments, a multilateral trade organization, and countries in the region.\textsuperscript{113}

The similarities between the Paraguay-Paraná hidrovia and the Rio Madeira hidrovia show that the Rio Madeira projects, if implemented irresponsibly, could test Brazil’s commitment to its constitution. If Brazil truly seeks to uphold its constitution, it could use these projects as an opportunity to establish a more responsible approach to sustainable development. To realize this objective, Brazil would need to break from its existing record of “openly promot[ing] environmentally harmful projects on the basis that abject economic and social conditions justify allocation of scarce public resources to productive development activities, rather than to environmental protection.”\textsuperscript{114} Brazil could accomplish this break by demanding strict compliance with its licensing process, chiefly through rigorous enforcement of EIA regulations. Also vital to the success of the EIA is the degree to which it accurately reflects and effectively evaluates the entire impact-generating project area. Reviewing the Rio Madeira projects’ progression through the licensing and EIA process reveals the shortcomings in the scope of the EIAs and indicates the need for a broader evaluation.

As noted above, the licensing process sets forth requirements that directly address potentially problematic aspects of development projects.\textsuperscript{115} Because these requirements are specific, compliance is easier to discern, and holding parties accountable and ensuring delivery of results is feasible. However, such results depend on the regulated entities’ cooperation in compliance and the existence of able and willing enforcers.

In the case of the Rio Madeira projects, the licensing regulations require that the projects be completed in a socio-environmentally sound manner. Up through the \textit{Licença Prévia} stage, the Brazilian government

\textsuperscript{113} Tucker, \textit{supra} note 66, at 314 n.84 (internal citations omitted).

\textsuperscript{114} Tucker, \textit{supra} note 66, at 314 (citing Roger W. Findley, \textit{Pollution Control in Brazil}, 15 \textit{ECOLOGY} L.Q. 1, 30 (1988)). \textit{Compare id.} with \textit{Cana Brava Letter, supra} note 9; \textit{Agência de Informação, supra} note 9; \textit{GTE-FBOMS, supra} note 9. One case exemplifying such a positive progression is the São Francisco dam project, for which IBAMA halted the licensing process due to lack of adequate consultation with the public. Interview with Fabrina Furtado, Executive Sec’y on Multifinancial Inst., Rede Brasil, in Brasília, Braz. (Aug. 4, 2006).

has made efforts to oversee some semblance of an environmental assessment process by adhering to the basic mandate of federal laws and regulations related to EIAs. Given the influence of FURNAS and its status as a state-run entity, however, strong pressure to push approvals through the necessary channels casts serious doubt on the integrity of the current assessments.\footnote{116. See Glenn Switkes, Int’l Rivers Network, Madeira River Complex: Opportunism in the Name of Integration, Dec. 1, 2005, http://www.biceca.org/en/Article_25.aspx.}

IBAMA has upheld its EIA-related obligations and formally requested complementary studies to the EIA and the Report of Environmental Impacts (RIMA) conducted for the proposed Santo Antônio and Jirau hydroelectric complexes.\footnote{117. See Informação Técnica No. 12/2006, COLIC-HID/CGLIC/DILIQ/IBAMA, Brasília, Feb. 24, 2006 (on file with author); Sandra Tavares, Complexo Requer Critério no Licenciamento, diz Ibama [Complex Requires Criteria for Licensing, says IBAMA], July 24, 2006, http://www.riosvivos.org.br/canal.php?canal=318&matid=9333.} However, those studies only encompassed a small area immediately surrounding the dam construction sites.\footnote{118. Interview with Moara Giasson, supra note 95.} IBAMA is legally authorized to verify the complementary studies by contracting with experts it regards as competent.\footnote{119. Id.} IBAMA indicated that based on the studies it received, further details would be necessary before it would grant the Licença Prévia.\footnote{120. Id.} In general, IBAMA did not find the quality of the studies to be poor, but rather sought a more integrated analysis of the potential environmental impacts, including water quality analysis and impacts on aquatic communities.\footnote{121. Id.}

IBAMA acknowledged the presence of mercury in the Madeira River and recognized the need to expand the analysis to include the riverbed, as mercury contamination there would adversely affect, and in many cases kill, fish and other species, including the local population that relies on these species for food.\footnote{122. See Tavares, supra note 117.} Likewise, IBAMA remains concerned about the livelihood of gold miners and fishermen due to the impact of mercury contamination.\footnote{123. Id.; Informação Técnica No. 12/2006, COLIC-HID/CGLIC/DILIQ/IBAMA, Brasília, Feb. 24, 2006, at 4 (on file with author).} In addition, IBAMA noted that current studies predict potential flooding in Bolivia if the complex is completed.\footnote{124. Interview with Moara Giasson, supra note 95.} Until the studies disprove this possibility, IBAMA asserted that it would not grant the license for the project.\footnote{125. Id.}

Still, despite these unresolved issues, IBAMA approved the EIA/RIMA and the complementary studies as sufficient in September.
2006, and audiências públicas were held after the EIA’s approval. According to IBAMA’s Director of Environmental Licensing, Luiz Felippe Kunz Júnior, “if all goes according to plan and the projects are deemed environmentally viable, IBAMA will grant the Licença Prêvia, followed by the Licença de Instalação, which allows construction to begin in August 2007.” Thus, despite the significant potential of the licensing process as a regulatory system, its role in the Madeira projects demonstrates its inability to effectively influence the outcomes of the projects so as to avoid the kinds of human rights violations that have arisen from similar projects in the past.

A. Identifying the True Extent of the Impacts

Ambiguity in the meaning of “impacts” and potential bias in those undertaking the assessments complicate the task of evaluating a project’s true effects. Yet the extensive impacts of large infrastructure projects are undeniable. In the words of the Inter-American Development Bank,

[the] diverse suite of the IIRSA projects ... makes it imperative to establish standard techniques for identifying specific project

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128. Tavares, supra note 117 (author’s translation).

Kunz avers that the push for development from business interests will not bully IBAMA into granting licenses prematurely. “For a dam of this scale, there is a risk of serious accidents if the licensing is conducted irrespective of criteria. IBAMA is not concerned with pressure [from government or business interests]. We are aware of the country’s need for energy production, but our primary concern is focused on the possible environmental impacts from a dam of this magnitude and of the damage that the population will suffer.”

Id. (emphasis added) (author’s translation); See also Faleiros, supra note 7.

Kunz, Jr., of IBAMA, has not set deadlines for the end of evaluations and assures that there is not any pressure by the government or businesses to approve the project. “Any project like this one, with impacts in a sensitive area, needs to be evaluated with caution in order not to have an environmental disaster.”

Id. (author’s translation).
components, social and environmental issues of concern and provisions for addressing such matters during the planning and implementation of hubs, groups of projects and individual projects. From an IDB perspective, there are corporate risks regarding potential sponsorship or endorsement of unsustainable initiatives. Consequently, it is advantageous to develop an early screening methodology that can enhance these important programs to ensure more sustainable and integrated development in specific areas and reduce safeguard risks.  

While the IDB’s recognition of the need for thorough assessments is commendable, it is necessary to explore further the meaning of the term “impacts.” Discrepancies between various interpretations of “impacts” appear when comparing the content of the EIA to the effects predicted in other studies of the Rio Madeira projects. Such inconsistencies include varying accounts of the projects’ boundaries and the class of people to be “affected” by the projects. Further questions arise regarding potential bias in the EIA and the credibility of information disseminated to the public about the projects.

A primary source of divergence in the estimation of projected impacts emerges from the definition of the projects’ boundaries. IBAMA staff described the project area as encompassing two dams in Brazil, one dam in Bolivia, a binational dam, and a hidrovia. Beyond these elements of the complex, in the even broader context of IIRSA, “efficient highways crossing the Andes must be built, in addition to the infrastructure projects necessary for river transport.” Despite this integration, for licensing purposes Brazil so far has concerned itself only with the (solely Brazilian) Santo Antônio and Jirau dams. While these two dams are clearly within Brazil’s territorial jurisdiction, Brazil could still assert rights to regulate the binational dam, for instance, by entering into

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130. Interview with Moara Giasson, supra note 95. See also Tavares, supra note 117.
131. ZIBECHI, supra note 3.
132. The process occurs as follows: An interested business contacts IBAMA expressing its intent to undergo the licensing process. IBAMA creates a team, often together with state and local environmental ministry personnel, who visits the project area at the business’s expense. IBAMA then develops Terms of Reference, indicating the data expected in the EIA/RIMA. Next, the party conducts and submits the EIA/RIMA, which IBAMA analyzes, along with its own diagnostic data procured from its initial site visit, to determine whether impacts are as minimal as possible. For instance, IBAMA considers details such as treatment of the affected population, degradation of the environment, preservation of species, and plans for compensation. If satisfied, IBAMA grants the Licença Prêvia. If not, it requests additional studies. Interview with Moara Giasson, supra note 95.
a treaty with Bolivia. Such an approach would benefit Brazil in the long run, as it faces potential liability for damaging effects its activities cause in other countries.

Like Brazil’s government, the business stakeholders among the Madeira project planners display a reluctance to undertake responsibilities commensurate with the scope of the project. FURNAS has acknowledged the broad implications of the Madeira project, noting that the “complex includes four hydro plants, two of which are planned in Brazil, one . . . on the Brazil/Bolivia border, and the other . . . in Bolivia,” adding that “[t]he Madeira project, with its . . . waterway extending far beyond the Brazilian border, will play a major role in a much broader context than just a national one.” As a preface to describing the project’s potential regional benefits, FURNAS asserts that “[t]o prevent, or at least reduce, environmental degradation, it is imperative to provide better opportunities for the local population as well as to increase governmental intervention by strengthening regional and local administrative agencies.”

Despite this rhetoric, FURNAS considers environmental analysis of the entire basin to be the government’s responsibility, not its own, because the projects are not classified collectively under IIRSA. If the government were to solicit a basin-wide assessment, FURNAS would be the entity charged with that task. As it stands, FURNAS will only evaluate the area that the government requires it to evaluate. The government, though recognizing the basin-wide implications of the project, has merely required that FURNAS evaluate the sites of the dam structures themselves, rather than the entire basin in which those dams will be located. Consequently, the government and FURNAS each evade

133. See Verena Glass, Negociações com Bolívia pode adiar obras de hidrelétrica [Negotiations with Bolivia Could Delay Hydroelectric Works], CARTA MAIOR, Dec. 19, 2006, http://agenciacartamaior.uol.com.br/templates/materiaMostrar.cfm?materia_id=13169 (describing the binational agreement entered into by Brazil and Bolivia on December 18, 2006, which created a work group to analyze environmental impacts of the dam complex in both countries).

134. See, e.g., United States v. Aluminum Co. of Am. (Alcoa), 148 F.2d 416 (2d Cir. 1945) (a state’s intentional action with substantial effects in another state’s territory can provide a basis for the affected state to assert jurisdiction); Ålström & Others v. Comm’n (“Wood Pulp”), 1988 E.C.R. 5193 (noting that a state’s action with direct, substantial, and foreseeable effects in another state’s territory can provide a basis for jurisdiction).

135. FURNAS, supra note 3, at 1, 5.

136. Id. at 6.

137. See Faleiros, supra note 7 (“Furnas considers the request [that it conduct an EIA for the entire basin] excessive. Mariangela Damberg affirms that there already exists a strategic environmental assessment that includes the impacts on the Bolivian border. ‘The function of evaluating the entire basin is the government’s,’ she emphasizes.”) (author’s translation).
Infrastructure Projects

responsibility for basin-wide assessments by pinning the blame for insufficient action on each other.

Failing to view these projects collectively produces EIAs of limited scope, obscuring the projected impacts by chopping them into small, seemingly insignificant pieces.\(^{138}\) Instead, recognizing that these projects are interrelated parts of a more extensive whole exposes the true consequences for the region. Members of the Executive Technical Group for the IIRSA Paraguay-Paraná Hub acknowledged this when they “agreed that the study conducted for the Hub’s Business Vision [focusing on the study of its area of influence] should be enlarged so as to include the four related sub-basins.”\(^{139}\) Such a shift may serve as useful precedent for a similar recognition in the Peru-Brazil-Bolivia hub.

Aside from differing interpretations of the project boundaries, ambiguity over who is “affected” by the taking of property for the project’s construction seriously frustrates the realization of just and fair compensation. Brazilian law does not define who is “affected” by dams, nor does it define the extent of impacts of dislocation.\(^{140}\) Construction firms that fund the EIAs usually end up formulating the definition of “affected population” by considering only landowners who have official title to the land.\(^{141}\) However, given Brazil’s historic practice of granting title primarily to aristocratic landowners regardless of whether they ever actually occupy the land,\(^{142}\) determining who is “affected” based on title-holding status does not necessarily represent the class of people who deserve compensation.

Serious discrepancy also exists regarding the anticipated effect on indigenous peoples. Though the government avers that “there is no interference with indigenous areas in the entire work area,”\(^{143}\) numerous other sources disagree. Foremost is the EIA itself, which includes

\(^{138}\) See id. ("In fact, the original Rio Madeira project involved the construction of international navigation channels, but due to controversy it was decided to license the dams separately from the waterway. In the EIA, the construction of locks on the Madeira is still foreseen, but not integration with Bolivia and Peru.") (author’s translation).


\(^{140}\) C.F. arts. 5, 182, 184; Eduardo Luiz Zen, Ditadura na Barranca dos Rios Brasileiros: perseguicao e criminalizacao de militantes da luta contra as barragens, in REDE SOCIAL, supra note 68, at 55.

\(^{141}\) Id. at 60–61.


“pressure on indigenous territories” among the cited adverse impacts.\textsuperscript{144} Other data supports the EIA’s findings, indicating that “approximately 3,000 indigenous communities are threatened by the proposed construction of the two hydroelectric dams in the Rio Madeira.”\textsuperscript{145}

Furthermore, these studies are performed by FURNAS-paid consultants and are therefore susceptible to bias. Brazilian law mandates independent EIA consultants,\textsuperscript{146} but IBAMA staff acknowledged the potential for bias, noting that the only protection the law truly offers is a consultant’s fear of legal consequences for signing off on the authenticity of altered data.\textsuperscript{147} Because this potentially biased data supplies the content of the EIA and complementary studies, it represents a conservative assessment of projected impacts and can be considered an objective minimum in anticipating human rights violations.

The information that FURNAS disseminates to the public should also be viewed with skepticism. For example, the FURNAS website states: “Another concern arises in relation to areas that will be flooded. They will be the same as [the areas flooded during] the annual floods of the Rio Madeira. That is, the highest water levels will be the same as that which normally occurs in January.”\textsuperscript{148} On its face, this observation does not sound alarming, but the reality is that the January flood levels will become permanent. This difference is “like the difference between taking a bath or living inside the bathtub.”\textsuperscript{149} FURNAS’ rhetoric illustrates the need for independent verification of the assessments; simply completing and submitting studies is insufficient to comply with the overall objective of the laws requiring EIAs.

Public participation is another area in which the business stakeholders’ portrayal often diverges from reality. In an article describing the Rio Madeira projects, FURNAS recognized the importance of public involvement:

\begin{itemize}
\item \textsuperscript{144} See FURNAS \textit{et al.}, supra note 8 (listing “pressure on indigenous lands” as eleventh in the list of medium-level adverse impacts, with a magnitude of ninety-two, where 150 is most severe).
\item \textsuperscript{145} Rede Brasil, \textit{Comunidades indígenas, ONGs e populações ribeirinhas discutem em Porto Velho a proposta de construção do Complexo do rio Madeira}, 2006, http://www.rbrasil.org.br/content,0,0,712,0,0.html (author’s translation).
\item \textsuperscript{146} Resolução No. 001/86, art. 7, de 23 de janeiro de 1986, D.O.U. de 17.02.1986 (Brazil) (“The environmental impact study will be conducted by a capable, multidisciplinary team, neither directly nor indirectly dependent on those behind the project and technically responsible for the projected results.”) (author’s translation).
\item \textsuperscript{147} Interview with Moara Giasson, supra note 95 (noting that the firms conducting the EIAs do not necessarily win the projects).
\item \textsuperscript{148} FURNAS, supra note 5 (author’s translation).
\item \textsuperscript{149} Email from Glenn Switkes, Int’l Rivers Network (June 6, 2006) (on file with author).
\end{itemize}
To validate an initiative on the scale of the Madeira complex . . .

it was necessary and valuable to bring society into the debate.
The project had undergone public evaluations at several fora,
from meetings with the local people to presentations at interna-
tional symposia and conferences. These debates have greatly
contributed to a comprehensive evaluation of the project’s bene-
fits and expected impacts, enhancing knowledge in relation to
the design, gaining public credibility, especially as regards the
local and regional population, and also winning respect from the
South American community.¹⁵⁰

Such broad claims could contain some truth only if that “commu-
nity” were derived from an unrepresentative sample.¹⁵¹ More concretely,
this purely retrospective observation seems to presume that the public
need no longer play a role in the ongoing process.

B. Identifying Human Rights Violations Arising from
Impacts of the Rio Madeira Projects

Both the EIA and other studies confirm that projected impacts span
social, economic, political, and environmental elements, among others.
As noted above, the Inter-American Court has found that human rights
violations may arise from neglect of a state’s duty to respect and guaran-
tee human rights along with violations of specific rights. Past recognition
of violations by the Inter-American Court and other human rights tribu-
nals suggests a similar result would emerge in the case of the Rio
Madeira.

1. Impacts on Society, Property, and Adequate Standard of Living

Socio-political impacts of the projects include alteration in the af-
fected population’s dynamics, quality of life, and social and political
organization; conflict between the local and migrant populations and
among local fishing populations; and general disruption (*intranqüili-
dade*) of the population. In addition, river communities, urban centers,
and the Teotônio and Amazonas peoples will be compromised. The qual-
ity of the land itself stands to suffer due to occupation of new areas,
pressure on indigenous territories, segmentation of communities, and
loss of agricultural area.¹⁵²

¹⁵⁰ FURNAS, supra note 3, at 6.
¹⁵¹ Instituto de Desenvolvimento Estratégico do Setor Energético, ONG vai à Justiça
?id=18789.
¹⁵² FURNAS ET AL., supra note 8.
On an economic level, aside from loss of agricultural land, the EIA anticipates loss of investment during the planning and evaluation phases, and compromised river-community transportation, infrastructure, and standard of living and wellbeing.\textsuperscript{153} Moreover, the EIA shows that the dam projects will result in fewer jobs (despite FURNAS's assurances that "the project will absorb 'all idle labour' near Porto Velho"), a decrease in economic activity, and a drop in income for miners.\textsuperscript{154} Based on these facts, it is not surprising that the assessment forecasts an increase in the price of services during construction, as well as increases in demand for public services and subsistence resources.

Project impacts also implicate property rights, as well as the right to an adequate standard of living. Property rights provide the basis for legal claims, as project construction will entail occupation of land and expulsion of inhabitants.\textsuperscript{155} As illustrated by the Candonga case,\textsuperscript{156} dam projects threaten the ability of affected individuals to support an adequate standard of living, security of tenure, provision of services, habitability, accessibility, adequate localization, and cultural adequacy. Similarly situated victims in Rio Madeira could bring challenges under the right to an adequate standard of living. Furthermore, as the right to water is a logical offshoot of the right to an adequate standard of living,\textsuperscript{157} contamination of river water related to the dam projects may lay the basis for an adequate standard of living claim.

2. Impacts on Health and Life

Direct threats to health include increases in mortality rates, machine and vehicular accidents, and risk of accidents with poisonous animals.\textsuperscript{158} Other adverse health impacts stem from likely increases in the incidence of malaria and other diseases; increase in metals, such as mercury, and non-metals in sediment; and poorer air quality.\textsuperscript{159} Given the impacts noted in the EIAs, victims in Rio Madeira, like those in the Yanomami case, could prevail in claiming violations of the right to health or right to life.\textsuperscript{160} However, the difficulty in proving causation for death or even for nonfatal harm arising from adverse impacts to health highlights the need for unassailable documentation in order to

\begin{itemize}
\item \textsuperscript{153} Id.
\item \textsuperscript{154} \textit{The Americas: Damned If You Do}, ECONOMIST, June 3, 2005, at 60.
\item \textsuperscript{155} See FURNAS ET AL., supra note 8.
\item \textsuperscript{156} See \textit{Justiça Global et al.}, supra note 9, at 70–71.
\item \textsuperscript{157} See supra Section III.A.
\item \textsuperscript{158} FURNAS ET AL., supra note 8.
\item \textsuperscript{159} Id.
\item \textsuperscript{160} Yanomami v. Brazil, Case 7615, Inter-Am. C.H.R., Report No. 12/85, OAS/Ser.L/VII.66, doc. 10 rev. ¶ 1 (1985) (under the "Resolves" section of the opinion).
\end{itemize}
succeed in such claims. If forced relocation results in death to victims, the Brazilian state could be held liable for complicity in murder, as it was in Corumbiara.\textsuperscript{161}

3. Impacts on the Natural Environment

According to the EIA, among the impacts on the natural environment are deforestation; loss of habitat (including reproductive habitat); interference with migration and species reproduction; loss of biodiversity, including numerous negative effects on flora and fauna; change in pH and ionic concentration of water; introduction of new species; and increase in sediment and erosion.\textsuperscript{162} Other studies note that construction of the Rio Madeira dams will occur in a region of great importance for biodiversity . . . affect[ing] approximately 700 species of fish and 800 species of birds . . . as well as isolated indigenous tribes that lack contact with society . . . [and are] not included in the Ministry of the Environment's environmental impact studies used for the environmental licensing process.\textsuperscript{163}

If and when the right to a healthy environment attains force in international or domestic tribunals, petitioners would have substantial grounds to bring claims challenging the protection of that right.

4. Impacts on Indigenous Peoples

Given the Rio Madeira project sites' proximity to indigenous peoples' lands, the likelihood that the construction of dams and other infrastructure projects will cause the expulsion of these people is distressingly high. Despite assurances from FURNAS, IBAMA, and the Brazilian Federal Ministry of Transportation that indigenous peoples will not be affected by the Rio Madeira projects,\textsuperscript{164} the EIA explicitly indicates otherwise, listing "pressure on indigenous territories" among the adverse impacts.\textsuperscript{165} Aside from the EIA, other sources evaluating the impacts have determined that the projects will adversely affect indigenous peoples.\textsuperscript{166} Infant mortality, suicide, murder, attempted murder, death

\textsuperscript{162} FURNAS ET AL., supra note 8.
\textsuperscript{163} Rede Brasil, supra note 145 (author's translation).
\textsuperscript{164} Interview with FURNAS staff, supra note 35; Interview with Moara Giasson, supra note 95; Brazilian Federal Ministry of Transportation, supra note 143 and accompanying text.
\textsuperscript{165} See supra note 144 and accompanying text.
\textsuperscript{166} See, e.g., AMBIENTE BRASIL, supra note 95.
threats, sexual violence, and violence against cultural heritage all have arisen from past dam construction near indigenous communities.\footnote{167. Paulo Maldos, \textit{Inventdrio de uma infamia – Violênci contra os povos indígenas no Brasil}, in \textit{ReDE SOCIAL}, supra note 68, at 77, 77–83 (recounting impacts on the Guarani-Kaiowá people in the state of Mato Grosso do Sul).}

According to Zacarias of the indigenous tribe Gavião, the construction of hydroelectric dams directly affects indigenous reserves, flooding tropical forests, such that the indigenous peoples will lose their heritage. "There are traditional cemeteries that preserve the history of the indigenous peoples, archeological areas that were not studied, all of which will be destroyed, leaving us with no future."\footnote{168. Rede Brasil, \textit{supra} note 145 (author’s translation).}


Based on facts established by EIAs and other supplementary impact assessments, as well as violations recognized by various international tribunals, the potential for human rights violations from the Rio Madeira projects is high. This potential indicates the need to take the full range of impacts into account as the projects proceed through the licensing process and implementation phase.

VI. CONCLUSION

The purpose of outlining the applicable rights and the potential ways they will be violated is not to advocate a reactive approach but to encourage preventive steps to avert such violations. The legal system recognizes the violation of these rights, but past practice indicates it is likely that these violations will recur. As a result, prudent planners should take this information into account and proceed with planning and
implementation of projects in a manner that will respect and protect individuals’ guaranteed human rights.

Past cases and current projections of impacts arising from the Rio Madeira projects indicate serious potential for violations of the rights to life, health, a healthy environment, and an adequate standard of living, as well as indigenous people’s rights. Liability for this harm will arise independently of whether an EIA accurately predicted such impacts. Yet tools like EIAs can minimize the negative effects by evaluating impacts and informing construction in a way that will decrease harm. In the case of the Rio Madeira projects, the failure of the current EIA to account for the full geographic scope of the projects’ effects demonstrates a need for a broader assessment, as many negative impacts will escape detection under a purely local lens.

Because Brazil’s national legislation establishes legal obligations to uphold human rights, the national courts may be a first point of adjudication should the dam projects proceed and produce the anticipated effects. However, should national courts fail to provide adequate protection, the Inter-American system has demonstrated its willingness to hear such claims. Moreover, if the government (through state entities like FURNAS or agencies like IBAMA) causes the harm, petitioners could satisfy the requirement of exhausting domestic remedies and thereby avail themselves of the Inter-American forum from the outset. Taking into account the gravity of harm to be expected from adverse impacts of infrastructure projects, along with the jurisprudence of human rights tribunals, the objective of avoiding human rights violations necessitates planning that reflects the true scope of the project area and its impacts.