

Policy instruments for political capacity: lessons from three infrastructure projects in the Brazilian Amazon

Instrumentos para a capacidade política: Lições de três projetos de infraestrutura na Amazônia brasileira

Ana Karine Pereira¹ i, Orcid: <https://orcid.org/0000-0002-7282-6122>; Daniela Rosim² ii, Orcid: <https://orcid.org/0000-0001-5882-9899>; Valéria Tavares Teixeira³ iii, Orcid: <https://orcid.org/0000-0002-7794-9543>

1. Universidade de Brasília – Brasil. E-mail: pereiraanakarine@gmail.com
2. Universidade Federal de Goiás- Goiânia - GO – Brasil. E-mail : danielarosim@ufg.br
3. Universidade Federal de Goiás- Goiânia - GO – Brasil. E-mail: valeriatt@hotmail.com

Abstract

The ongoing debate over development strategies highlights the importance of infrastructure to boost economic and social growth, but several studies have pointed to state capacity deficits to plan and implement infrastructure projects. This paper aims to investigate the construction of policy instruments for the political state's capacity to implement large hydroelectric plants in the Brazilian Amazon. We resorted to a within-case analysis through the congruence method. Data analysis reveals that despite the development and activation of participatory policy instruments in the Brazilian democratic era, these were not enough to produce high levels of political capacity. Therefore, state bureaucracies still fail in addressing the demands of affected vulnerable groups. This can be explained by the asymmetrical development of political capacity in the structure of public administration; the use of political capacity instruments in the advanced stages of the policy process; the contestation of the mapped demands from the participatory process by state bureaucracies.

Palavras-chave: Amazon. Brazil, hydroelectric plants, political capacity.

Resumo

O debate atual sobre estratégias de desenvolvimento tem destacado a importância da infraestrutura para impulsionar a economia e o desenvolvimento social. Porém, vários estudos têm apontado déficits de capacidade estatal para planejar e implementar projetos de infraestrutura. O objetivo deste artigo é investigar os instrumentos de capacidade política do Estado para a implantação de grandes hidrelétricas na Amazônia brasileira. Realizamos estudos de caso aprofundado a partir do método da congruência. A análise dos dados revela que, apesar do desenvolvimento e da ativação de instrumentos participativos na era democrática brasileira, estes não foram suficientes para produzir altos níveis de capacidade política, o que faz com que as burocracias estatais ainda falhem em atender as demandas de grupos vulneráveis afetados por empreendimentos de grande vulto. Isso pode ser explicado pelo desenvolvimento assimétrico da capacidade política na estrutura da administração pública; pelo uso de instrumentos de capacidade política em estágios avançados do processo de formulação de políticas; e pela contestação das demandas mapeadas pelas burocracias estatais nos processos participativos.

Keywords: Amazônia. Brasil, usinas hidrelétricas, capacidade política.

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1 Introduction

The infrastructure sector is strategic for sustained development in terms of both economic and social aspects (Gomide and Pereira, 2018). This finding has driven an increase in investment in this sector throughout the world in the 21st century (Flyvbjerg, 2014). In Brazil, the years from 2007 to 2014 were marked by various government efforts to stimulate the infrastructure area, including the Growth Acceleration Program. Despite that, several studies have pointed out the low state capacity, all over the world, in delivering infrastructure ventures since their implementation has been characterized by delays, budget overruns and incomplete or insufficient benefits (Flyvbjerg, Garbuio, Lavallo, 2009; Abers, Oliveira and Pereira, 2016). The poor performance of these projects is especially evident in the implementation of large hydroelectric dams in the Brazilian Amazon, because this region is peopled by traditionally vulnerable communities who coexist with a complex biodiversity. Besides that, the Brazilian Amazon region is marked by violent land conflicts and poor social development (FGV; IFC, 2017)

Beginning in the 1970s, during the Brazilian authoritarian military regime (1964-1985), the government began prioritizing a strategy featuring an increase in electricity and the construction of large hydroelectric dams and plants in the northern region of the country, where the greatest unexploited hydroelectric potential is located. If on one hand, this strategy has resulted in an expressive increase in the production of hydroelectric energy, studies have stated that the implementation of these enterprises has provoked profound changes in the water supply, climate, and geography (Tundisi, 2007). We can add the social impacts on traditional and river-dwelling populations that depend on access to water for their subsistence; the proliferation of diseases and epidemics associated with water; and the strong migration of people to cities where these plants are implemented which has caused an overload in terms of basic services (Fainguelernt, 2016; Fearnside, 2015; Grisotti, 2016).

This paper aims to investigate the development of state capacity to implement hydroelectric dams in the Brazilian Amazon. We do that by focusing on the evolution of policy instruments for political capacity to reconcile interests and incorporate the socio-environmental demands of vulnerable groups affected by these ventures. More specifically, we conducted this analysis in two political contexts: the Brazilian military authoritarian regime (1964-1985) and the Brazilian democratic governments (since 1985). To do that, we resorted to a within-case analysis through the congruence method, exploring three cases of hydroelectrical plants built in the Amazon: Tucuruí I, Teles Pires, and Belo Monte.

2 Operationalizing and developing effective political capacity: causal hypotheses

All around the world, the planning and implementation of large infrastructure enterprises are considered to fail in terms of local development, social expectations and uneven risks (Flyvbjerg, Bruzelius, Rothengatter, 2003; Flyvbjerg and Sustain, 2016). The national and international literature agree that a solution to this is the inclusion of affected communities in the decision-making process of large infrastructure projects, which would increase legitimacy and produce improvements in the projects (Hyland and Bertch, 2017). However, there are several obstacles for this incorporation to occur - such as the sociodemographic condition of the societal actors (Barclay and Klotz, 2019; Acselrad, Mello and Bezerra, 2009); the experience in previous mobilizations (Hochstetler and Trajan, 2016); and governance models,



whether more or less centralized (Groves et al, 2013). A study by Barclay and Klotz (2019) on the participation of society in infrastructure projects in the United States, points out that political support is fundamental for the effective inclusion of these actors. Similarly, research by Trajan and Hochstetler (2016) revealed that the participation of actors from society in the decision-making process of infrastructure projects in Brazil depends on state allies. In this article, state support for the participation and inclusion of actors affected by large infrastructure projects is investigated based on the concept of political state capacity.

Political state capacity is understood as the ability to implement projects and policies upon demands conciliation, which enhances policies' legitimacy (Pereira, Mertens, Abers, 2023). Its operationalization is associated with the existence of deliberative institutions prescribed by participatory debates (Evans, 2015; Evans, Huber and Stephens, 2017), which depict several policy instruments – such as public hearings and public policies councils – that transform participation as a “management method” (Pires e Vaz, 2014). The activation of these participatory instruments would strengthen state capacity and the ability of governments to offer inclusive public policies (Pires et al., 2012; Grass Peixoto, 2015) since social control and the influx of information coming from society to state would enable bureaucracies to correct governmental programs and to include the demands of actors that are traditionally excluded from the policy process (Mcpherson, 1977; Cook e Morgan, 1971; Lumbabo e Coelho, 2005). Based on these debates, we developed a causal hypothesis to explain state incapacity to halt severe social and environmental impacts of hydroelectric plants implemented in the Brazilian Amazon in the context of autocratic regimes: *the lack of participatory instruments prevents state bureaucracies to map social and environmental demands, which, consequently, are not incorporated in the implementation process.*

In Brazil, one of the stages of the environmental licensing process is the public hearings, which, according to Conama's resolution n. 9/1987, must take place before the issuance of the preliminary environmental license and have as the main objective the presentation and discussion of the project's environmental impact studies to the affected communities (Pereira, 2013). According to Hochstetler and Keck (2007), this formally represents the only real opportunity for vulnerable communities to contest and present their demands amid a large infrastructure planning process.

However, empirical studies about infrastructure projects in Brazil, Thailand, United States, and Canada present evidence that the mobilization of participatory instruments did not result in the positive impacts on state capacity predicted by the participatory democratic literature (Almer and Koonz, 2004; Manowong and Ogunlana, 2006; Abers, 2016). This means that the link between participatory instruments and state capacity strength is not automatic. As a response to that, the literature about participatory democracy lists several requirements for the effectiveness of these instruments – such as the inclusion of vulnerable actors in the deliberative process (Alencar et al., 2013; Fuks, Perissionoto e Ribeiro, 2003), and the incorporation by the state bureaucracy of the demands expressed in the participatory arenas (Dagnino, 2002). It is common that these requirements are not implemented due to conflicts and power asymmetries, in a context where actors that hold influential resources refuse to share power with marginalized groups (Dagnino, 2008).

The political sociology conception of policy instruments developed by Lascoumes and Le Galès (2004, 2004), following Linder and Peters (1993), reinforces this argument by claiming that instruments are not neutral, but political since their selection and implementation is related to the exercise of power. In this sense, instruments are considered institutions and therefore a form of power as they structure public policies and their outcomes, privileging certain actors and excluding others, and driving forward a specific representation of problems.

Therefore, many case studies reveal that policy instruments are highly contested (Tak, Sam and Jackson, 2016; Maggioni, 2016; Kassim and les Galès, 2010). Policy instruments also produce their own political effects, which can be unintended and incompatible with the policy goals ascribed to them. Consequently, policy instrumentation can be a complicated and contingent process (Lascoumes e Les Galès 2007).

Combined with the literature on participatory democracy, this debate reveals that the simple activation of participatory instruments might not be effective to increase political capacity since contestations of these devices might hinder their effectiveness. Together, these kinds of literature shed light on the importance of power asymmetries to understand effective political capacity development and operationalization.

Inspired by these debates, we propose a causal hypothesis to explain the state incapacity to halt severe social and environmental impacts of hydroelectric plants implemented in the Brazilian Amazon in a democratic context: *disputes over infrastructure projects reduce the effectiveness of participatory instruments. In this situation, social and environmental demands are mapped but do not reach the implementation process.*

3 Methodology

In this paper, we applied a theory-test congruence method¹ to confirm the existence of the causal relationship claimed in the two hypotheses presented in the previous section. A congruence theory test should be used in cases where the hypothesized causal relationship is present, which means that only typical cases where both cause and outcome are present are selected (Beach and Pedersen, 2016). In this sense, for the autocratic context, we selected Tucuruí I; whereas for the democratic context, we selected Belo Monte and Teles Pires. Regarding the causal hypothesis applied to the autocratic context, the cause is the lack of participatory instruments; whereas in relation to the causal hypothesis applied to the democratic context, the cause is the low effectiveness of participatory policies due to disputes and contestations. In both cases, the outcome is a low state capacity to incorporate social and environmental demands leading to great impacts.

The first step for applying theory-testing congruence is to evaluate the prior probability of the causal hypothesis (Beach and Pedersen, 2016). The prior probability of our first hypothesis is high since, as shown in the previous section, there are several studies that relate participatory instruments to state capacity strength. The prior probability of the second hypothesis is also high as the literature points out that the mobilization of participatory instruments might be contested and therefore do not produce the expected beneficial results on state capacity. When there is strong prior confidence in the relationship being present, it is recommended to engage in robust congruence case studies, applying a cluster test (Beach and Pedersen, 2016). In the cluster type of congruence test, we employ a battery of non-overlapping propositions that states which evidence we should find in a case to confirm the causal hypothesis (Scriven, 2011). These propositions are usually theoretically certain but not very unique, which configures a “hoop test” (Collier, 2011). Since the propositions are independent of each other, they might be combined to achieve a degree of theoretical uniqueness that enables relatively strong confirming inferences to be made if the predicted evidence is found.

¹ Its typologies are described at Moller and Skaaning (2016).



To test the first causal hypothesis, we elaborated two propositions: 1) State bureaucracy has no knowledge of socio-environmental demands and does not systematize them, and 2) socio-environmental demands are not incorporated in the decision-making process.

To test the second causal hypothesis, we developed three propositions: 1) *participatory instruments are centralized in the socio-environmental bureaucracy*; 2) *participatory instruments are mobilized late in the decision-making process*; and 3) *the mapped demands from participatory process are contested by state bureaucracies responsible for the development agenda*.

To investigate the above propositions, we used document analysis. In the case of Tucuruí, we searched for information in the World Commission on Dams reports from 1999 to the final report in 2000, which are available on the commission website. Related studies were also used along with the 2018 Environmental Management System Manual for the Tucuruí plant, which was produced by, and is available from Eletrobrás/Eletronorte. Since the plant was implemented before the current Brazilian constitution of 1988, we were not able to find documents related to or similar to those which today are called environmental licenses or sustainable development plans. To analyse the Belo Monte process, we performed documental analysis of the first 34 volumes of the environmental license, which cover the period from 2006 to 2012. We also analysed public civil actions by the Public Ministry. Meeting minutes of civil society groups – such as public hearing minutes in 2009 and videos of public hearings – were also studied. In the case of Teles Pires, the analysis was focused on information available regarding the environmental licensing process and reports produced by *Instituto de Pesquisa Econômica Aplicada - IPEA* (Ocon, 2015 and Abers, 2016) about the decision-making and the plant implementation processes. We consulted reports produced by the organization Movement of Affected by Dams (*Movimento dos Atingidos por Barragens*) and the Teles Pires Forum. We also performed a documental analysis of the first 30 volumes of the environmental license process.

4 Case Study Results

4.1 Hydroelectric Plant in the Autocratic Regime

The Tucuruí I hydroelectric plant is located on the Tocantins River in the state of Pará. The construction of the plant was initiated in 1975, and it began operating commercially in 1984. Tucuruí I today provides roughly 70% of the total energy produced in the Northern Region of Brazil. Its planning and implementation took place during the Brazilian military dictatorship (1964-1985), in a political regime characterized by technocratic centralization in the production of public policies, repression of social mobilization and protests, and various limitations on social participation in the planning process of government projects and policies (Hochstetler and Keck, 2009; Khagram, 2018).

The first debates about the construction of the plant were inspired by by the National Security Policy, the National Integration Policy, and the Developmental Agenda. Within this context, the Brazilian Amazon became the site of various governmental projects designed to protect the nation's frontiers; provide natural resources for developmental projects; and to incorporate the region into the national production system (Becker, 1982; Serra and Fernández, 2004).

At the time, the state presented a high capacity to deliver this plant, given that its delays and budget overruns were relatively insignificant. The decision-making process for Tucuruí

occurred in an expeditious manner: Eletronorte² began the plant feasibility studies in 1973 and in 1975 the plant's construction began (Pereira, 2013).

The speed with which the plant was constructed may be explained by the number of actors included in the decision-making process and by the legislation governing the interactions and attributions of governmental bodies. Its decision-making process occurred during a time characterized by the consolidation of the electricity sector and the creation of its governmental bodies and legislation – such as the Ministry of Mines and Energy, and Eletrobrás and its subsidiaries. On the other hand, this period was marked by fragility in the environmental sector before the creation of the National Environmental Policy and the Brazilian Institute for the Environment and Renewable Natural Resources (Ibama³) (Hochstetler and Keck, 2007). Within this context, the decision-making process for the plant was characterized by a great focus on the electricity sector, who centralized most of the decision power.

If state capacity to execute this venture is considered high, the same cannot be said of its capacity to process interests and the demands of vulnerable communities. State low political capacity is due to the lack of effective policy instruments since there are no records of public consultations and every attempt to initiate participatory planning designed to mitigate environmental problems has been rapidly interrupted (WCD, 1999).

Regarding proposition I, document analysis confirms that the bureaucracy had few knowledges about social-environmental demands since the feasibility studies were conducted by the energy sector that focused only on the developmental demands (La Rovere and Mendes, 2000). As demonstrated in table 1, most of the socio-environmental demands were not mapped before the implementation phase. Only in 1977, Eletronorte hired ecologist Robert Goodland in an attempt to map and mitigate socio-environmental demands. He recommended that Eletronorte prepared a schedule for deforestation, social, cultural, environmental and archeological inventories together with animal rescue programs, ecological preservation measures, and water quality controls. As a consequence, Eletronorte signed an agreement with the National Research Institute for Amazonia (INPA - Instituto Nacional de Pesquisas da Amazonia) and entrusted it with the responsibility of carrying out most of the recommended studies. However, neither the Goldman report nor the INPA studies were able to produce relevant changes, since they were concluded after the plant implementation initialization. Therefore, the environmental variable - pointed out by popular demands - was incorporated late in the case of Tucuruí I (WCD, 1999).

Table 1- Actors, demands, policy instruments, and problem-solving in the Tucuruí I case

Affected social groups	Demands/Claim	Participatory Policy instruments to map demands	Demands were mapped before implementing the project	Public Policy to attend demand	Problem solution
Fisheries communities	Public policies for maintaining fisheries	Absent ⁴	Partially	Absent	Absent

² Centrais Elétricas do Norte do Brasil S/A, known as Eletronorte is a company in the electric sector in Brazil that operates in the Amazon Region.

³ The Brazilian Institute of the Environment and Renewable Natural Resources, better known by IBAMA is the executive body responsible for the execution of the National Environment Policy

⁴ The classification "absent" was chosen in the cases where we did not identify: participatory policy instruments; public policy to attend demands; a solution to the socio-environmental problem caused by the infrastructure problem.



Local communities	Health and sanitation policies to avoid the proliferation of disease-causing mosquitos	Absent	No	Absent	Absent
Parakanã indigenous community	Maintenance of subsistence activities	Absent	No	Parakanã Program	Partially
Asurini indigenous community	Maintenance of subsistence activities	Absent	No	Absent	Absent
Parkatêjê indigenous community	Maintenance of subsistence activities	Absent	No	Absent	Absent
Riparian community downstream	Resettlement policy	Absent	No	Resettlement policy conducted by INCRA and Eletronorte	Partially
Riparian community upstream	Resettlement policy	Absent	No	Resettlement policy conducted by INCRA and Eletronorte	Partially

Source: prepared by the authors

Considering the second proposition, since various impacts of Tucuruí I were discovered only after its implementation, several demands of the affected population were not target with compensatory measures (Table 1). This is the case of the fisheries communities demands, whose absence of specific public policy culminated in a drastic decrease in commercial fishing in this region: it fell from 900 metric tons/year in 1981 to 492 metric tons/year in 1998 (WCD, 1999).

The number of cases of malaria increased in the years subsequent to the filling of the reservoir. The proliferation of mosquitoes of the genus *Mansonia* also caused great disruptions in the local population. However, no measures were taken to diminish the proliferation of these diseases or to meet the special health needs of the population (WCD, 1999).

Another problem provoked by the plant has to do with the demands of the Parakanã, Asurini and Parkatêjê indigenous groups who lived in the area affected by the formation of the reservoir. The sustenance of these groups was based on subsistence activities and the limited regional market. In 1987, Eletronorte, through a partnership with FUNAI⁵, developed the “Parakanã Program,” which achieved satisfactory results:

“The program contributed to the expansion of the Parakan, and their establishment of new villages, which, parallel to their traditional hunting and gathering activities, has been important in maintaining the integrity of the Parakan Indigenous Reserve. (WCD, 1999)

Despite the positive results of the Parakanã Program, the Asurini, situated downstream from the dam, were not considered.

Only in 1979, Eletronorte signed an agreement with INCRA to analyze financial compensation and resettling local communities' policy. In the region downstream from the

⁵ The National Indian Foundation (Funai) is the official indigenist organ of the Brazilian State. Its mission is to coordinate and execute the Federal Government's indigenous policies, protecting and promoting the rights of indigenous peoples.



Tucuruí plant no claims were negotiated with the local population. For the region upstream from the Tucuruí plant, due to pressure from the affected population, Eletronorte changed its relocation policy and negotiation was the solution to avoid an impasse. However, there are still sectors that are dissatisfied with the indemnification and refund policies it followed. According to the World Commission on Dams, displacements and settlements are seen by local residents as an open matter because they were not consulted (WCD, 1999). More specifically,

“The resettlement process took place late and in a very limited manner with little or no consideration given to the livelihood patterns of the families. This negligence was evident when riverbank communities were resettled inland and when the extractive communities were settled in lands requiring farming” (WCD, 1999).

4.2 Hydroelectric Plants in the Democratic Regime: the Belo Monte hydroelectric plant

The decision-making process for the Belo Monte hydroelectric plant began in the 1970s, during the military government (Dória, 1976; Fearnside, 2006). There were strong protests against this plant even at that time especially because the initial project envisioned the flooding of part of two Indigenous Lands: Paquiçamba and Arara of the Volta Grande (Jaichand and e Sampaio, 2013). The strong social mobilization – which culminated in the First Meeting with the Indigenous People of Xingu in 1989 – and the subsequent decision of the World Bank to block the financing of the plant, provoked the suspension of the project at the end of the 1980s (Carvalho, 2006).

The project resumed in 1994 when Eletronorte, Eletrobrás⁶ and the National Department of Water and Electricity (DNAEE)⁷ revisited the project to make it viable in terms of its environmental, social and economic aspects. One of the main changes made was reducing the size of the reservoir to 199 square miles, which avoided the flooding of the Indigenous Lands. However, to make the plant energetically efficient, the plant envisioned diverting the flow of water from the Volta Grande region of the Xingu, along a stretch of roughly 60 miles, to an area of forests and agricultural settlements. This is the largest Reduced Flow Segment produced by hydroelectric plants in Brazil, and it denies access to the water of the Arara and Juruna do Paquiçamba Indigenous Lands (Jaichand and Sampaio, 2013; Magalhães and Hernandez, 2009).

The resumption of the Belo Monte project occurred during a new political context. First, the new political regime, consolidated by the 1988 constitution, is characterized by the decentralized management of public policies and the proliferation of participatory democratic institutions (Santos, 2009). Specifically, with the democratization of Brazil, the decisions about the construction of dams were now being made by society, with the involvement of many governmental institutions and the affected population (Costa, 2010). This change was the result of reform in environmental legislation, which was initiated in the 1980s and culminated in the mandatory realization of environmental studies and emission of environmental licenses for ventures that have an environmental impact; the scheduling of public hearings during the

⁶Eletrobras (Centrais Elétricas Brasileiras S.A.) is a mixed-capital and publicly traded company controlled by the Brazilian Federal Government and acts as a holding company, created to coordinate all companies in the electricity sector.

⁷DNAEE is the department responsible for the planning, coordination and execution of hydrological studies throughout the national territory; for the supervision, inspection and control of the water uses that alter its regime; as well as for the supervision, inspection and control of electricity services.

licensing process; and the special attention paid to indigenous communities, with the exploitation of hydric resources in Indigenous Lands depending on legislative authorization and indigenous hearings (Hochstetler and Keck, 2007; Hochstetler, 2020).

In the first decade of this century, the political agenda of resumed economic growth, expressed by the Growth Acceleration Program (PAC) of 2007, repositioned the Belo Monte plant as a strategic project. Thus, during this period there was an acceleration of the decision-making process for this plant: in 2005, Congress approved Legislative Decree N° 788, authorizing the implementation of the hydroelectric plant; in 2010, it received a Provisionary Environmental License (LP) from Ibama; in 2011, it received an Installation License (LI) from Ibama; and in April 2015 it was awarded an Operating License (LO).

This period of acceleration in the decision-making process for Belo Monte was marked by protests against the plant. The demands of the affected population were quite varied (Table 2). The fishermen demanded compensation, given that fishing would be unviable in certain stretches of the river (Magalhães, Silva and Vidal, 2016; Magalhães and Hernandez, 2009). Other groups fighting in defense of indigenous rights, such as the Indigenous Missionary Board (CIMI) and the Federal Public Ministry (MPF), emphasized that the Reduced Flow Segment would make fishing and cultural rituals unviable (Vilaça, 2017). Environmentalists also claimed the creation of conservation units and the strengthening of state's regulatory capacity. Other groups demanded that the state prepare the region to receive a large influx of people caused by the construction of the plant based on improvements in local infrastructure and the offer of basic social services (Pereira, 2014).

Table 2- Actors, demands, policy instruments, and problem-solving in the Belo Monte case

Affected social groups	Demands/Claim	Participatory Policy instruments to map demands	Demands were mapped before implementing the project	Public Policy to attend demand	Problem solution
Indigenous communities located at the "Volta Grande do Xingu"	Adequate water levels in Reduced Flow Segment in order to maintain subsistence and cultural activities	Public hearing, government office and committee of the Xingu Sustainable Regional Plan	Yes	Environmental license condition and Xingu Regional Sustainable Development Plan	Partially
Fisheries communities	Public policies for maintaining fisheries	Public hearing, government office and committee of the Xingu Sustainable Regional Plan	Yes	Xingu Regional Sustainable Development Plan	Partially
Local communities	Strengthening of public utilities related to public security	Public hearing and committee of the Xingu Sustainable Regional Plan	Yes	Environmental license condition and Xingu Regional Sustainable Development Plan	Partially
Local communities	Strengthening of public utilities related to basic sanitation	Public hearing and committee of the Xingu Sustainable Regional Plan	Yes	Environmental license condition and Xingu Regional Sustainable Development Plan	Partially



Local communities	Strengthening of public utilities related to public health	Public hearing and committee of the Xingu Sustainable Regional Plan	Yes	Environmental license condition and Xingu Regional Sustainable Development Plan	Partially
Local communities	Strengthening of public utilities related to public education	Public hearing and committee of the Xingu Sustainable Regional Plan	Yes	Environmental license condition and Xingu Regional Sustainable Development Plan	Partially
Environmental NGOs	Environmental protection policies	Public hearing and committee of the Xingu Sustainable Regional Plan	Yes	Environmental license condition and Xingu Regional Sustainable Development Plan	Partially

Source: prepared by the authors

Considering *Proposition I*, document analysis reveal that, during the decision-making phase, participatory instruments to process this contentious period were mobilized especially by socio-environmental agencies, especially by Ibama. The first of these initiatives was represented by the organization of four public hearings⁸ in 2009 by Ibama in the Xingu region of influence. However, these hearings were considered insufficient to process socio-environmental demands. Local population criticized the strictly informational nature of these events; the low representation of the actors affected by the plant; and the lack of giving back to society (Fonseca et al., 2013). In addition to the hearings, the period before the emission of the Provisionary License was marked by the holding of informal meetings between environmental analysts and the groups affected by the plant, an example of which was the meeting with indigenous groups in September 2009 in the Casa do Índio, in the city of Altamira. Despite these limitations, to environmental analysts, these hearings and meetings were essential to their getting to know the demands of the affected population:

“Among the most forceful protests by the local community during the time of the public hearings were those related to the issue of the infrastructure of the cities that would receive a larger quantity of people due to the construction of the Belo Monte hydroelectric plant. These issues were based on the need to expand health, educational, sanitation, housing and transport services considering that currently the city of Altamira was not meeting the needs of the local population” (Ibama, 2010, p.5).

In this sense, before implementing the hydroelectric plant, all these demands were mapped and known by state bureaucracies (Table 2). Most of them were incorporated and transformed into environmental conditions (Table 2). Thus, in Technical Note N° 7 GAB/PRESI/IBAMA of November 27, 2009, the Ibama analysts evaluated the content of the main documents generated by civil society that potentially indicated public policies and conditions for the environmental license. As a result, the environmental analysts prepared Anticipatory Actions, which referred to the group of conditions established by the Provisionary License to prepare the Xingu region with basic services and local infrastructure to receive the Belo Monte plant. Despite these advances, a large portion of the anticipatory actions had not been implemented by the time the Installation License was granted: thus, the Installation

⁸ The realization of these hearings was envisioned by Conama Resolution n° 9/1987.



License was emitted without 13 conditions established in the Provisionary License having been completely implemented (Ibama, Technical Note 08/2011).

During the same period, civil society and Ibama began to mobilize the Chief of Staff's Office to readopt the idea of implementing the plant in parallel with executing a regional development plan. Within this context, the Chief of Staff's Office led a dialogue between the governmental bodies involved in the planning of the dam, which culminated in the readoption of the plan and the inclusion, by the electric sector, in the regulations for the bids for constructing the plant, the requirement that the winning company should invest R\$ 500 million to make the plan's projects viable. The result was approved by a presidential decree⁹ that instituted, under the aegis of the Chief of Staff's Office, the Xingu Regional Sustainable Development Plan (PDRS-X) and its committee.

However, the beginning of the plant's implementation in June 2011 was marked by the continuation of social protests. At the time, several contentious issues remained: for instance, the fishermen had not been classified as a group affected by the venture; and the consequences of the Reduced Flow Segment on the indigenous population still remained to be defined. As a response to that, the federal government intensified policy instruments for political capacity, what led to the creation of the Government Office (*Casa de Governo*) and the organization of the managing committee of the Xingu Regional Sustainable Development Plan.

The Government Office was instituted by Decree N° 7,577/2011, based on the indication of representatives of the General Secretariat of the Presidency of the Republic – whose function was the formalization of the dialogue with social movements – and the Ministry of Planning, Budgeting and Management – which was responsible for the articulation between the state agencies involved in federal government ventures in the region, with an emphasis on Belo Monte. However, local communities reveal that this body had a great capacity in mapping local demands, but low capacity in directing them to the agencies that would be responsible to execute them (Pereira, 2014; Pereira and Gomide, 2019).

The managing committee of the Xingu Sustainable Regional Plan in turn was organized with representatives of local and federal government, and civil society actors. The goal of the committee was to manage in a participatory manner the 500 million reais provided by the winning bidder. To do this, technical chambers for various axes of discussion were created – health, infrastructure, indigenous issues, production incentives, etc. These chambers determined which projects were the priorities for their respective themes. By 2016, the committee had approved 280 projects (Rios, 2013). However, some civil society actors reported the difficulty of small organizations or those with few professionals have in getting their projects priority, in addition to the fragmented nature of most approved projects (Pereira and Gomide, 2018; FGV-IFC, 2017).

In the Belo Monte case, the activation of participatory instruments was effective to map socio-environmental demands, during the decision-making process, and also to approve policies within the Xingu Regional Sustainable Plan, at the plant's implementation phase. However, these policies were implemented too late or were too fragmented to halt the hydroelectric severe consequences. After the inauguration of Belo Monte, in 2016, it is very clear that these demands were not successfully implemented (Table 2). Current studies associate Belo Monte to increase in violence (Reis and Souza, 2015), overload of basic public services (Gauthier and Moran, 2018), deforestation (Jiang et al, 2018) and impoverishment of traditional populations (Magalhães, Silva and Vidal, 2016).

⁹Decree No. 7340 of October 21, 2010.



One explanation for the low implementation of the demands mapped by the participatory instruments described above is the temporality of their mobilization (Proposition II). Civil society actors were organized to express their demands related to Belo Monte since the 1980's. However, the first participatory instruments happened late in the decision-process, only when the environmental license process began. At this moment, some important features of the project had already been defined – such as location and amount of energy produced –, which prevented the incorporation of some demands, especially those related to the indigenous and fisheries communities (Pereira, 2014). Besides that, the intensification of the mobilization of policy instruments for political capacity, with the creation of the Government House and the committee of the Xingu Sustainable Regional Plan, happened when the hydroelectric plant was already being implemented, causing at best the effect of alleviating problems, without actually solving them.

A second explanation for the low implementation of the demands mapped by the participatory instruments is the contestation by the electric sector (*Proposition III*). More specifically, the need to speed up the decision-making process halted a process started by social-environmental agencies to implement compensation measures.

In this sense, the conflicts between environmental analysts and Ibamas high-ranking bureaucracy is revealed in the environmental license process, when these analysts published in January 2010 several technical advices (Parecer nº 06 de 2010/Dilic; Despacho nº 05/2010/COHID; Nota Técnica nº 04/2010) that recommended the environmental license decline since there were contradictions and pendency in the Belo Monte final project, and there was not enough information to support the environmental approval. Especially, there were not sufficient technical data about the Reduced Flow Segment. Despite that, the Provisionary License was approved in February 2010. The same conflict happened during the analysis of the environmental license for implementing the project. In this sense, a few weeks before the license approval, environmental analysts published the technical note nº 08/2011, pointing out that environmental measures established in the Provisionary License had not been implemented. In January 2011, about a month before the second license approval, the electric sector sent the following document to the Ibamas president:

“It is noteworthy that, due to the strategic and priority characteristics of the Belo Monte HPP to maintain the balance between the supply and demand of electricity in the country, the maintenance of the schedule of the works of the enterprise and compliance with deadlines and agreements established in the concession contract are imperative, under penalty of serious risks to the entrepreneur and cumulatively to society. Therefore, I request your Excellency's attention, so that the issuance of the Installation License for the undertaking will occur until February 15, 2011, allowing the mobilization in March for the effective start of works in April of this year” (environmental licensing process Belo Monte AHE, page 3768).

4.3 Hydroelectric Plants in the Democratic Regime: The Teles Pires hydroelectric plant

The Teles Pires Hydroelectric Plant is part of a complex of plants on the Teles Pires and Tapajós Rivers, which produces significant impacts especially in terms of Indigenous Lands (Abers, 2016). The absence of any free, prior and informed consultation and consent process with indigenous peoples is highlighted, as determined by Brazilian legislation and international agreements with which Brazil is a party (Fórum Teles Pires, 2017). The plant was constructed

between the cities of Paranaíta, in the state of Mato Grosso, and Jacareacanga, in the state of Pará, and it possesses a minimum installed potential of 1820 MW. The debates about its construction date back to the 1980s. However, the inventory studies that were initiated during this decade were inconclusive and were only resumed in 2001, through a technical and financial accord (ECE-1407/2001) between electric sector agencies - Eletrobras, Eletronorte and Furnas¹⁰.

As in the Belo Monte case, the beginning of the decision-making process for the Teles Pires plant was marked by the leading role of the electricity sector. Thus, Eletrobras and Eletronorte prepared the environmental studies; while Furnas was responsible for the engineering studies. In 2005, the hydroelectric inventory of the Teles Pires Watershed was approved by the electricity sector regulatory agency - ANEEL and in 2008 the first plant feasibility studies were initiated, and the environmental licensing process was initiated in 2009.

In 2011, after the approval of the plant feasibility studies by the electricity sector, the government positioned the construction of the Teles Pires Plant as one of the priorities of the Growth Acceleration Program. From this point forward, there was an acceleration of the decision-making process: the installation license (LI 818/2011) and the operating license (LO 1272/2014) were emitted in 2011 and 2014 respectively; and commercial operations began in 2015 after approval from Aneel¹¹.

The plant's construction was well evaluated by the Growth Acceleration Program's Management Secretariat. Thus, in June 2011 former President Dilma Rousseff presided over the contract signing ceremony for the Teles Pires Hydroelectric Plant concession and the plant achieved the lowest price in terms of MW/h in the country. In the 2014 Yearend Review of the Growth Acceleration Program, this project was considered a "success" and "adequate" in terms of its rhythm of execution.

The group in favor of the plant is represented by the public employees of municipal government bodies and local politicians. This group argues that the construction of the plant, as long as it respects legal environmental conditions, will bring development to the region beyond new opportunities in terms of employment and infrastructure. In the group opposed to the plant, the main actors are the Cayabí, Mundukuru and Apiaká indigenous tribes; actors of organized civil society¹², and researchers who act through the Teles Pires Forum and the Public Prosecutor's Office. This group mainly argues that the construction of this hydroelectric plant will affect sacred indigenous lands. They also fear that the rivers will dry up and harm the fish population and regional fishing tourism. As a result of these critiques, in 2011 an indigenous group questioned the scope of the venture, which resulted in interference by the Federal Public Prosecutor's Office which culminated in an interruption of the plant decision-making process for ninety days. The main demands were the consolidation of the archaeological heritage of the Pedra Preta site; the extraction and destination of wood from the affected area; the generation of employment following the demobilization after the project's conclusion; compensatory measures for the removal of the seven-stage waterfall (Table 3).

¹⁰Furnas Centrais Elétricas S/A is a Brazilian subsidiary of Eletrobras, linked to the Ministry of Mines and Energy, operating in the high and extra-high voltage generation and transmission segment. The company operates in the Southeast, South, Midwest and North regions of Brazil.

¹¹The National Electric Energy Agency (ANEEL) is an autarchy linked to the Ministry of Mines and Energy. Its purpose is to regulate and supervise the production, transmission, distribution and sale of electricity.

¹² Like International Rivers, the Movement for Those Affected by Dams, the Pastoral Commission of the Land, the Humanitas Institute, the Rural Homeless Workers Movement, and the Popular Audiovisual Center, among others.

Table 3- Actors, demands, policy instruments and problem solution in the Teles Pires case

Affected social groups	Demands/Claim	Participatory Policy instruments to map demands	Demands were mapped before implementing the project	Public Policy to attend demand	Problem solution
Indigenous community and local communities	Practicability of subsistence, tourism and cultural activities	Public hearing	Yes	Environmental license condition and Territorial Development Plan from Paranaíta, Jacareacanga and. Alta Floresta	Partially
Local communities	Compensation measures for the removal of the seven-stage waterfall	Public hearing	Yes	Absent	Absent
Local communities	Creation of urban ecological corridors	Public hearing	Yes	Absent (responsible Ministry was informed, but did not presented a policy to attend the demand)	Absent
Fisheries communities	Implementation of sluice gate and transposition of fish	Public hearing	Yes	Absent (Ministry of Transport was informed, but did not presented a policy to attend the demand)	Absent
Local communities	Generation of employment after the demobilization of the project	Public hearing	Yes	Environmental license condition and Territorial Development Plan From (Professional Skills Program called Believe)	Partially
Local communities	Strengthen the capacity to offer local public services (such as health, education and safety) and infrastructure in the face of population growth	Public hearing	Yes	Environmental license condition and Territorial Development Plan for Paranaíta, Jacareacanga and Alta Floresta	Partially
Indigenous community	Inclusion of indigenous components in the Environmental Impact Study	Public hearing	Yes	Development plan for the Cayabí, Mundukuru and Apiaká indigenous tribes	Completely
Local communities and Indigenous community	Extraction and destination of wood	Public hearing	Yes	Wood from flooded areas has been stocked in storage patios awaiting a determination of its final destination	Partially
Local communities and Indigenous community	Indemnification for altering natural resources	Public hearing	Yes	Environmental license condition (in the installation license expedited by Ibama, an environmental compensation program was stipulated with a value of R\$ 15,971,258)	Completely
Local communities and Indigenous community	Improving the local supply of energy	Public hearing	Yes	Absent	Absent



Indigenous community	Partnerships for dealing with indigenous issues (water quality and life quality)	Public hearing and committee of the Development Plan	Yes	Development plan for the Cayabí, Mundukuru and Apiaká indigenous tribes	Partially
Local communities	Financial resources for environmental compensation should be destined for municipalities	Public hearing	Yes	Environmental license condition	Completely

Source: prepared by the authors

Similar to the Belo Monte case, in Teles Pires, participatory instruments were centralized in the environmental bureaucracy (*Proposition 1*). The main instrument used by the bureaucracy to get to know demands was the public hearing (Table 3). Even though groups of activists and researchers made an effort to debate the issue remotely using the internet, it may be noted that the state displayed no interest in engaging other mechanisms to find out any demands that were not presented in the public hearings. Even though state bureaucracies were able to map several demands before implementing the project, the public policies to attend to them were insufficient (Table 3).

The main policy to make these demands viable was the preparation of a Basic Regional Territorial Development Plan for this area, conducted by local mayors. They also proposed implementing, to respond to the concerns of local civil society in terms of employment, a Continuing Professional Skills Program called Believe to prioritize the hiring of local workers through training in skilled labor. However, no plan was developed to generate employment after the end of the project.

In terms of meeting the demands of the indigenous tribes, three basic indigenous environmental plans were developed. However, the specific demands of the indigenous peoples were not contemplated due to the argument that just the São Manoel Plant, which is part of the Teles Pires-Tapajós complex, would really affect Indigenous Lands. On the other hand, indigenous groups argue that even though this project will not produce direct impacts on Indigenous Lands, it will affect their ways of life, especially the destruction of a waterfall of great cultural value (Ocon, 2015; Abers, 2016).

One explanation for the low implementation of the demands mapped by the participatory instruments described above is that the activation of participatory instruments happened too late. In this sense, in the beginning of the decision-making process conducted by the electric sector process there was no interference from other sectors. The participation of other actors only took place during the environmental license process, mainly within the context of public hearings in the year 2010.

In the Tele Pires case, there was also conflicts around the socio-environmental mapped demands. In this sense, there were demonstrations by the Public Ministry, indigenous leaders and even from the attorney general of the Republic at the time, Rodrigo Janot, who requested that the licensing process should be interrupted until the incorporation and implementation of the demands mapped by the participatory processes, especially the indigenous causes of the Apiaká community, as it is demonstrated by the public hearing report:

The representative of the Kaiaby people spoke out against the holding of AHE Teles Pires. Members of the Mundukuru Kaiabi ethnicity questioned why environmental



studies do not include their village in the analysis of impacts (Minute 2, 11/21/2010).

Differently from the Belo Monte case, here, IBAMA's bureaucrats did not engage in actions to defend and enable these demands, which reveals that it predominated an exclusive dispute between society and the state.

When comparing the three cases, there is a significant difference between Tucuruí I and the cases that fall within the democratic context. Thus, while in Tucuruí participatory instruments were not mobilized, which culminated in a lack of knowledge by the state bureaucracy about socio-environmental demands and the absence of public policies and solutions for them; in Belo Monte and Teles Pires, the State was able to map the demands of those affected by the developments based on participatory instruments. However, conflicts surrounding the project and its demands hindered the adoption of effective policies in terms of scope and time, meaning that the demands of those affected were not fully met.

5 Final Considerations

This article seeks to trace the evolution of the political capacity of the Brazilian state in incorporating socio-environmental demands and the interests of vulnerable groups in the decision-making process of hydroelectric plants in the Amazon. The application of the theory-test congruence method based on “hoop tests” enhances our confidence in our two theoretical hypotheses. The Tucuruí case highlights the importance of participatory instruments for political capacity to process conflicts and socio-environmental demands. In the absence of these instruments, state bureaucracies are not able to map these demands in time, halting any chance to incorporate broad socioenvironmental claims. The cases of Belo Monte and Teles Pires reveal the development and mobilization of policy participatory instruments in the decision-making process of infrastructure projects. However, disputes over these projects reduced the effectiveness of the participatory instruments. In the case of Teles Pires, the environmental agency did not engage in actions to defend the mapped socioenvironmental demands, which culminated in contestations from other state agencies. In Belo Monte, disputes took place between the environmental agencies and the developmentalism bureaucracies.

Based on the case studies, we argue that the development of state political capacity occurred mainly in the environmental sector and is concentrated during the environmental licensing phase since the actions of the electricity sector are still based on an insulated technical logic. Since environmental agencies possess less decision-making power and it is a target of political pressure (Abers, Oliveira and Pereira, 2016; Pereira, Mertens, Abers, 2023), besides acting late in the decision-making process of infrastructure projects (Pereira, 2013), the overall state capacity to process socio-environmental demands were still low in the cases that took place in the Brazilian democratic era.

These findings reinforce the conclusions of previous empirical studies on the implementation of large infrastructure projects in the Brazilian Amazon – such as Abers, Oliveira and Pereira (2016) and Pereira, Mertens and Abers (2023), who point to the asymmetry of the State as a factor that makes it difficult to meet socio-environmental demands in these cases. It also corroborates with the international literature, which highlights that governance arrangements are relevant for the incorporation of demands in the context of the implementation of large infrastructure enterprises (Groves et al, 2013).



The paper also presents some theoretical contributions. Inspired by the political sociology approach of policy instruments, we demonstrate that the development of state capacity is not associated only with technical and neutral instruments, but also with the balance of power between actors. By investigating why the mobilization of participatory instruments did not produce high levels of political capacity, the paper dialogues with relevant questions elaborated within the political sociology conception of policy instruments: how do the conflicts produced by policy instrument development affect its effectiveness? How policy instruments are operationalized? (Kassim and les Galès, 2010). The case studies reinforce the literature about policy instruments that states that they produce unintended and incompatible effects with the policy goals ascribed to them (Lascoumes e Les Galès 2007). Thus, in an extremely contentious policy field, such as it is the infrastructure sector, the effort to build political capacity must go beyond the simple activation of participatory instruments, also requiring power distribution to the state bureaucracies involved in the decision-making and implementation process. We believe that this paper also contributes to the current Brazilian governmental debate about resuming investment in infrastructure projects as a strategy to boost economic recovery post-covid 19 crises (BNDES, 2020¹³; Brasil/Ministério da Economia, 2020¹⁴). The conclusions presented here argue contrary to the recent federal government decisions to limit participatory instruments in the environmental field during Bolsonaro's government (2019-2022) (Capelari et al., 2020), since the cases demonstrate that the participation of civil society in the decision-making process of infrastructure projects should be improved and expanded.

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ⁱ PhD in Political Science from the University of Brasília (UnB). Adjunct Professor at the Center for Sustainable Development at UnB. Brasília - DF – Brazil

ⁱⁱ PhD in production engineering from the USP - São Carlos School of Engineering. Adjunct Professor at the Faculty of Administration, Accounting Sciences and Economic Sciences (FACE/UFG) at UFG and at the postgraduate program in Administration at FACE/UFG.

ⁱⁱⁱ Master in Administration from the postgraduate program at the Faculty of Administration, Accounting Sciences and Economic Sciences at FACE/UFG.

