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On the Negative Effects of Environmental Peacebuilding.

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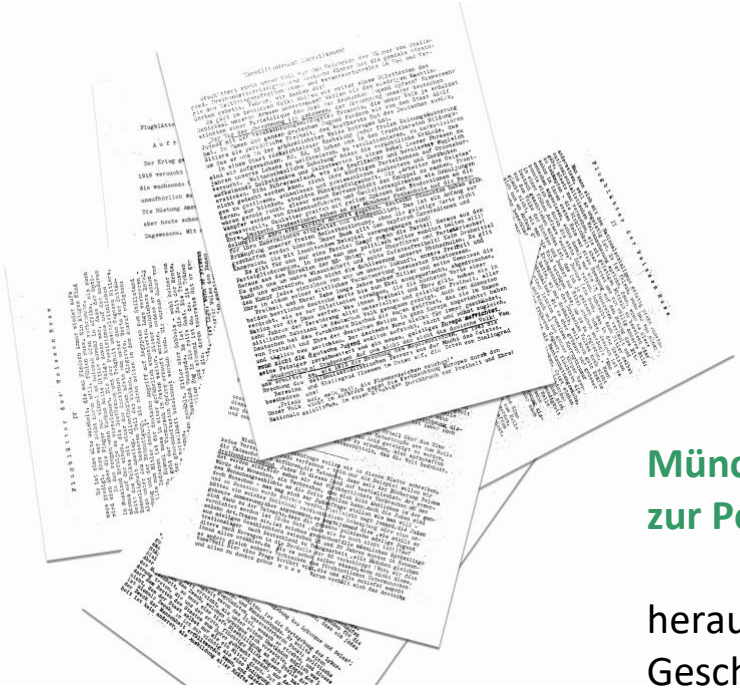

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Harmfulness of Displacement through Hydropower Development. On the Negative Effects of Environmental Peacebuilding.

Bachelorarbeit bei
Dr. Michael Neureiter
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Abstract

In the past three decades, environmental concerns and their link to violent conflict have become more salient than ever. Through an increase in academic interest in the so-called climate-conflict nexus, scholars began highlighting social impacts of industrial development through the exploitation of environmental resources. In this context, the negative social effects of hydropower development, especially displacement, began gaining recognition while formerly being overshadowed by the popular reputation of the eco-friendly electricity source. This thesis argues that by adhering to procedural justice and by giving fair compensation to the displaced, adverse impacts of displacement can be mitigated. After analysing three selected cases of hydropower induced displacement in Brazil, evidence supporting the hypotheses is still scarce.

1 Introduction

In the last few decades, environmental concerns have increasingly gained the attention of politicians, scholars, the media and the general populous alike. These concerns span a wide array of now immediately familiar topics such as resource exploitation, pollution or man-made climate change, and have paved the way for various environmental and political movements. Similarly, the rising attention has laid the groundwork for new fields of (interdisciplinary) academia. Notably for this work, scientific interest in the so-called "climate-conflict-nexus" (Burrows & Kinney 2016) has increased significantly (Sharifi et al. 2020) in the thirty-five years since the since the so-called Brundtland-Report in 1987 (UNEP[1] 1987). It became clear very fast that human security and the environment are interlinked, if however, the direction of these causalities is often not so certain.

At the same time, global environmental politics has begun an era of transformation, with most states seeking to lower their climate impact. In the pursuit of phasing out fossil fuels in electricity production, renewable energy sources like hydropower have become attractive to countries with ready access to the untapped energy potential of large river systems, for example the Amazon in South America (Stickler et al. 2013). With this, several concerns arose, highlighting the social and environmental impacts of the basin construction. While environmental factors like the change of the local climate or impact on biodiversity (see Botelho et al. 2017, McCartney 2009) have been given some academic attention, there seems to be less literature on the social impacts of large-scale dam construction[2]. One of these social impacts is the near impossibility of developing hydropower without causing some form of human displacement for

[1] In this work, inline citations referring to international bodies with long names (like the UNEP, IPCC) will be abbreviated in order to retain readability of the text.

[2] This is based on own observations while reviewing the literature for this work, and easily tested by entering the terms "environmental impacts of large-scale dam construction" and "social impacts of large-scale dam construction" into a literature database like Google Scholar or the Clarivate Web of Science. Former term will consistently produce a multiple of the results of the latter.

the creation of the basin[3]. The displacement, in turn, can cause or catalyse a plenitude of other negative effects like poverty and crime rates, and even have negative environmental impacts in return. Some scholars have thus argued that migration and violence work in a self-amplifying vicious circle (Morales-Muñoz et al. 2020), especially if socially vulnerable populations are displaced (ibid.: 17).

For regions like the amazon basin, that are (excluding some urban centres) largely populated by riverside fishing communities and over 250 remaining indigenous groups (Little 2003), this poses the important question of what can be done to address the social impacts of hydropower development and potentially mitigate or even prevent harmful outcomes. In this context, *harmfulness*, i.e., the scale of the negative outcomes, needs to be defined carefully as outcomes often fall beside a dichotomic either-good-or-bad system.

This work will give an overview over the current and historical state of scientific literature on the climate-conflict-nexus. Through this, a theoretical background will be established to frame presumed links between procedural justice, fair compensation and the harmfulness of displacement through hydropower development. Finally, a cross-case comparison of four cases of hydroelectric dam construction in Brazil will be used to discuss the links proposed above.

2 Theory

In this chapter, a theoretical background on the field of environmental peacebuilding will be given. For this, a historical context needs to be established to show its roots in classical security literature. A short introduction into the literature of environmental peacebuilding will then be followed by a longer explanation of a recent development in the sector, highlighting potential adverse impacts of environmental peacebuilding. Finally, central cornerstones of this thesis like displacement, hydropower and social justice and their relevancy to the field will be elaborated, conceptualized and legitimized for their use as variables in chapter 3: Hypotheses.

2.1 How did we get here? A historical overview

In the second half of the 20th century, the United Nations World Commission on Environment and Development published a report titled "Our Common Future" (UNEP 1987). Nicknamed the "Brundtland Report" after the former Norwegian prime minister and chair of the commission Gro Harlem Brundtland, it focuses on topics like environmental issues,

[3] So-called instream hydroelectric generators do not rely on the potential energy created by dams but use the already existing mechanical force of the running stream to create electricity. However, these systems are rarely used as their total output capacity is lower than the much more common basin-based design.

sustainability as well as human security, and proposes joint action to address these concerns (ibid.). Going forward from the Brundtland report, over the three decades since its release, there has been an influx in scientific literature (Sharifi et al. 2020) on what is commonly called the "climate-conflict-nexus" (Burrows & Kinney 2016). Early literature focused mainly on how resource scarcity impacts human security (Homer-Dixon 1994, 1999), which was at the time an unconventional expansion on the existing security research in political science. The basic causality chains described by Homer-Dixon assume that resource scarcity, often through industrial exploitation of the environment can cause violent conflict in the adjacent population, and even lead to involuntary displacement (ibid). This link, however, was later deemed overly "deterministic" by scholars like Conca and Dabelko (2002), who highlighted the deescalating potential of (institutionalized) cooperation over environmental resources. In this context, they coin the term "environmental peacemaking", a form of reconciliation of nations at odds through environmental agreements (ibid.). Later, the term "environmental peacebuilding" (see Swain & Öjendal 2018, Ide 2019a, 2019b, 2019c; Ide et al. 2021 and Ide 2021) is introduced to further supplement classical peacebuilding theories (Barnett et al. 2007). Since the fourth assessment report of the Intergovernmental Panel on Climate Change (IPCC 2007), the Paris Agreement (UN 2015) as well as the establishment of the 2030 Agenda through the United Nations (UN General Assembly 2015), there has been a multi-phase increment in literature on the links between climate and conflict (Sharifi et al. 2020). Even so, the evidence brought forward by case studies does not (yet) clearly indicate the causal mechanisms and their directionality (ibid.). This is, perhaps, a direct effect of the laborious task of controlling for the numerous external variables interfering with the proposed hypotheses.

2.2 Environmental Peacebuilding

While the term peacebuilding commonly refers to post-conflict cooperation to "strengthen and solidify peace" (ibid.: 35), in the context of environmental peace it is often used as an umbrella term[4] for general cooperation over environmental resources between two distinct actors (Dresse et al. 2018). Tobias Ide et al. (2021) identify four central mechanisms through which environmental peacebuilding can work: *"conflict prevention, mitigation, resolution and recovery"* (ibid.: 3). By including prevention and mitigation, they expand on the classic post-conflict approach and provide more proactive measures to address conflict. Unfortunately, defining environmental peacebuilding proves to be difficult. Firstly, there is no consensus in

[4] For a concise synopsis of the various terms used in contemporary environmental peace literature, please see "Table 1" in Dresse et al. (2018: 104).

literature as to what constitutes peace and what defines environment (Dresse et al. 2018). Secondly, the contemporary field remains *"fragmented"* (ibid.: 101) through the lack of an overarching frameworks. Instead of constituting a new intellectual school with uniform literature and fixed epistemological assumptions (ibid), environmental peacebuilding assumes the *"unfortunate"* (Ide 2019a: 6) role of a more loosely associated collection of academic work. However, as environmental challenges mount, and the necessity of peaceful resolution of conflict is as high as ever (ibid.), environmental peacebuilding still serves an important role in the literature of political science and international relations. For this work, a relatively open interpretation brought forward by Ide et al. (2021) will be used to attempt to draft a definition: *„environmental peacebuilding comprises the multiple approaches and pathways by which the management of environmental issues is integrated in and can support conflict prevention, mitigation, resolution and recovery"* (ibid.: 2-3).

2.3 Full circle: negative effects

In the above paragraphs, the academic transition from Homer-Dixon's securitization of environmental issues (Homer-Dixon 1994, 1999) to the recognition of deescalating potential through cooperative processes (Conca & Dabelko 2002) was briefly outlined. In recent years, however, there has been a return[5] of interest to negative correlations between environment and security, with Tobias Ide (2019b) outlining a new framework for negative effects of environmental peacebuilding. In that sense, theory on the climate-conflict-nexus has come a full circle, first focusing on negative impacts of environmental factors, then ways in which cooperation is possible, and finally (and most recently), the potential negative impacts of cooperation over environmental resources.

For this work, Ide's idea of splitting negative effects of environmental peacebuilding into "*six Ds*" (ibid.: 4) will be adapted. With *depoliticization, displacement, discrimination, deterioration into conflict, delegitimization of the state* and *degradation of the environment,* Ide composes a broad array of easily conceptualizable negative impacts through evidence from cases. These impacts are, of course, not mutually exclusive, and show interaction effects that are in large parts also negative (ibid.: 14). In the following section, each of the six Ds will be briefly outlined[6] to firmly establish a theoretical basis, and to facilitate later references to interaction effects. It shall be noted that, in the opinion of the author and considering the limited scope

[5] The word "return" is used here not to imply a decline in literature on negative effects, but to signalize a shifting focus in an ever-broadening field of research (see also Sharifi et al. 2020)

[6] Essentially, the following section is a very condensed synthesis of Ide (2019b: 7-18). It is thus recommended to additionally consult the original article, as its elaboration on the six Ds is considerably more detailed.

of this thesis, three of the six Ds present themselves more accessible than others: *displacement, deterioration into conflict* and *degradation of the environment*. Undoubtedly, working with *discrimination, delegitimization of the state* and *depoliticization* is possible (see for example Aggestam & Sundell 2016, Hill et al. 2017, Castro-Diaz et al. 2018), but is certainly more difficult to conceptualize since they are frequently measured by indicators, whereas the amount of people displaced, or the hectares of land made unfruitful by industrial waste are easy to grasp in numbers. As is obvious through the title of this work, a focus will be put on "displacement", its many different names, what constitutes it and why.

In environmental peacebuilding, frequently pragmatic-technical solutions are favoured, even if the underlying conflict is a socio-political one. *Depoliticization* refers to this process of "hiding" behind a solution which does not address the core drivers of the conflict and even actively draws attention away from them (Ide 2019b). A fitting example is brought forward in Ide 2021: The explorative study done by Aggestam & Sundell (2016) on the depoliticization of the Israeli-Palestinian water conflict. The authors find that, in prioritizing radically apolitical solutions, power imbalances are veiled, and private sector firms are sometimes the recipient of enormous power in the peace processes (ibid.).

Delegitimization of the state happens frequently when one or more of the conflict-affected actors see fault in the state for (at least partially) causing one of the other five Ds (Ide 2019b). Of course, the delegitimization happens on a spectrum; one end being mild distrust of state actors and the other outright withdrawal of legitimacy.

"[D]iscrimination along ethnic, social or gender categories" (ibid.: 9) in environmental peacebuilding is often found when considering which actors profit from any given project. Kakabadse et al. (2016) find that, looking back on a historic conflict between Ecuador and Peru, bilateral agreements indeed led to lasting peace between the nations, but the subsequent distribution of mining- and forestry licenses to corporations discriminated against the local indigenous population.

The *"worst case"* (Ide 2019b: 18) scenario for any peacebuilding venture is *deterioration into conflict.* In this case, the intended effect of building peace through cooperation gets reversed, and environmental peacebuilding creates or incites (more) conflict. At first, this connection sounds highly speculative, if not outright illogical. This is, until you consider the interaction effects mentioned in the second paragraph of this chapter: If a peacebuilding project, for example, uses up an excessive amount of environmental resources, it can lead to a scarcity conflict in the sense of Homer-Dixon (1994, 1999). The same reasoning applies even more

directly to *degradation of the environment.* Through unsustainable use of natural resources (e.g., to enable economic growth), scarcity conflicts can threaten human security. Furthermore, in reference to Conca and Beevers (2018), Ide (2021) warns that environmental peacebuilding could *"simply constitute more efficient exploitation of resources"* (ibid.: 18), bringing up a case study on peacebuilding in Colombia, which paved the way for fossil fuel exploration (Ide 2021)

The central focus of this work will be on (human) *displacement.* As outlined previously, displacement is generally very accessible, if it is defined concisely[7]. What then, constitutes displacement, and why is it relevant? Usually, a look into established international frameworks is helpful, though in this case, there is a long history of various terms used flexibly with no uniform definitions. Displaced persons (and refugees) are recognized and protected under resolution 62(I) of the United Nations General Assembly (UN 1946), which was practically the establishing document for the United Nations Refugee Agency. The resolution defines "displaced person" as someone, *"who […] has been deported from, or has been obliged to leave, his country of nationality or of former habitual residence"* (UN 1946: Part I, Section B). Unfortunately, for several reasons this definition is impractical for contemporary academic work on displaced persons. Firstly, through the historical context of the resolution, it is heavily geared toward a post-World-War-II context[8], which is the context of origin for the resolution. Secondly, the definition only applies to transboundary displacement, excluding any displacement that occurs within national borders. In United Nations terms, this would later be called "internal displacement" (see UN OCHA 2004), and the Internally Displaced People or Persons (IDPs) described as *"people forcibly uprooted from their homes […] who remain within the borders of their own countries"* (Deng 2004: 1[9]). Sometimes, the terms *"involuntary resettlement"* (see World Bank 2001) or "forced migration" (Randell 2017, Mayer et al. 2021) are used in a comparable fashion to displacement. Interestingly, the World Bank Manual (2001) includes the loss of access to assets or means of livelihood, for example fishing or forestry resources, in its impact coverage (ibid.: 3(a)). Because people affected in this manner must relocate their life in some sense, it could fall under a broader definition of "displacement". The manual also accurately highlights why resettlement can have extensive adverse social and economic consequences for the displaced population, like poverty risk, resource competition (which can lead to scarcity conflicts), loss of physical assets and/or cultural identity or dispersion of communities, (ibid.). In summary, establishing a broad yet concise definition of displacement is difficult, as is choosing from one of

[7] The question of how "displacement" is understood matters greatly in the process of case selection, as only cases with a certain type of displacement and certain number of displaced people will be considered. Chapter 5 elaborates on this issue.
[8] Referring to Part I, section A, paragraph 1 (a) (ibid.), the definition limits itself to people displaced by fascist and Nazi regimes.
[9] For some reason, the foreword has not been provided with page numbering. The here cited excerpt is found on the first page of the foreword, or the seventh page of the publication (including cover sheet and title matter).

the various terms that are used comparably. Throughout the following chapters, the term "displacement" will be used, adapting the definition by the World Bank as *"a process by which development projects cause people to lose land or other assets, or access to resources. This may result in physical dislocation, loss of income, or other adverse impacts"*[10].

2.4 Why hydropower?

In the above chapters, a very broad field of theory which encompasses a plethora of correlating factors was outlined. As it would be impossible for the scope of this work (or any single work) to elaborate on causal links across the world of displacement in environmental peacebuilding and climate conflicts, the following section attempts to legitimize the limitation of the scope to hydropower development only, and to establish why hydropower is increasingly relevant in this context.

This work adapts the popular definition of hydropower, as in referring to the method of producing electricity using water. Commonly, the water is retained in a basin through one or more dams, and controllably released through turbines which, in a similar fashion to "classic" thermoelectric electricity generation, convert the mechanical force into electrical energy. Unlike the thermoelectric systems, which rely on the burning of fossil fuels like coal, oil and gas, hydroelectric powerplants do not emit greenhouse gasses in the process of producing electricity. Seemingly, only the construction and the upkeep costs have considerable environmental impacts. Further than that, in comparison to other renewable energy sources like wind and solar, hydropower is cheaper to produce on a large scale and more reliable, as it is not dependent on weather (Stickler et al. 2013). Hydropower would thus appear to be the holy grail of solutions to (sub-)tropical nation's energy woes and carbon emissions worries. Countries rich in hydropower resources, in regions like the Amazon, Mekong or in the Congo basin, have recognized this potential: In the Amazon basin[11], for example, countries' energy budgets rely heavily on

[10] This definition was originally intended to frame displacement in the context of involuntary resettlement. Citation taken from http://web.worldbank.org/archive/website00518/WEB/OTHER/FAQSHTML.HTM, last on 28.06.2022.

[11] Here, "Amazon Basin" refers to the wider geological feature including central and northern South America.

hydropower, with an average of the total yearly electricity production of just under 60 percent:

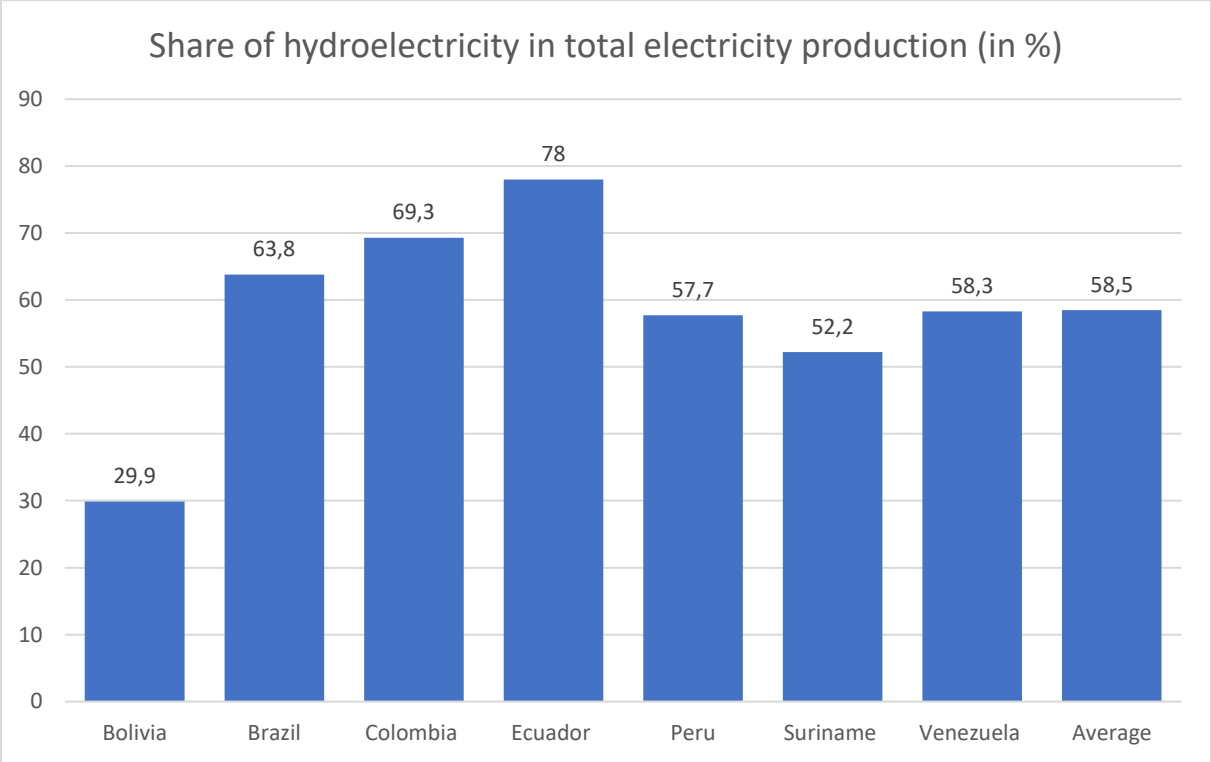

Figure 1: Share of hydroelectricity in total electricity production in 2020 (Bolivia, Brazil, Colombia, Ecuador and Peru) and 2019 (Suriname and Venezuela). Own depiction. Data taken from: International Energy Agency, https://www.iea.org/countries, last on 27.06.2022.

Even so, the yet untapped potential often surpasses the current installed capacity many times over (ibid.). This means that, assuming current sustainability trends are successfully consolidated into national policies, and with the help of international investors, countries are likely to see an expansion of hydropower development in the coming years and decades.

As mentioned above, hydropower presents itself as a benevolent, cheap and eco-friendly solution to this century's climate crisis and appeals to emerging market nations like Brazil which are seeking increased energy security (Zarfl et al. 2014). Thus, the "real" cost of hydropower is often overshadowed by its green image. While it is true that hydroelectric powerplants emit next to no greenhouse gasses once operational, the environmental and social impacts of hydropower development are frequently overlooked. Even so, this imbalance disproportionally affected social impacts. Ecological risks of large-scale dam construction like change of the local climate, precipitation change, or downstream impacts had been under scrutiny for years until finally, around the turn of the millennium, social impacts began to be highlighted (Cernea 1997). Additionally, environmental effects like precipitation change are often considered more directly (quantitatively) observable than social impacts like discrimination along gender lines (see Hill et al 2017, Castro-Diaz et al. 2018).

It is worth noting that the social impacts seen from hydropower development differ from "traditional" water conflicts, which often revolve around the availability of (potable) freshwater resources (Little 2003, Mulreany et al. 2006, Aggestam & Sundell 2016, Swain 2016, Kim et al. 2021). Even if pollution of rivers and other bodies of water is increasing through continued industrial expansion, for example the mining of ores like bauxite (Acero 1999, Das 2001), the *"abundance"* (Little 2003) of freshwater in regions like the Amazon Basin makes scarcity conflicts in the sense of Homer-Dixon (1994, 1999) unlikely. Nevertheless, as displacement through hydropower development disproportionally affects vulnerable riverside fishing communities and indigenous peoples (Little 2003), these are not "second-rate" conflicts, but serious socio-political issues that warrant more scrutiny.

Certainly not all hydropower development falls under the category of environmental peacebuilding, even with a broad definition as outlined in previous chapters. However, due to the intertwining of national governments, local institutions and international corporations as well as investors, this work will adapt Ide's (2019b) six Ds (see chapter 2.3) to frame its theoretical arguments under an already established framework. As geographical proximity makes cross-case comparisons more reliable, this work will focus only on hydropower development in Brazil.

2.5 Procedural Justice

"One clear possible avenue for the peaceful resolution to conflicts is through an understanding of the psychology of social justice." (Tyler 2004: 436)

In the current literature on links between energy development and social or environmental impacts, the concepts of social justice and energy justice accommodate several sub-concepts like environmental justice (see Schlosberg 2004), procedural justice or distributional justice. Social justice and energy justice are both well established, and although procedural justice certainly does depend in some fashion on the "parent"-concepts, a detailed background on social justice as well as energy justice is not necessary and would go beyond the scope of this work. As procedural justice is central to the theoretical argument of this work, an outline of procedural justice as it is defined commonly in energy development literature will be presented in the following paragraphs.

Procedural justice is commonly understood as a *"fair and equitable process"* (Mayer et al 2021) or plainly *"due process"* (Sovacool et al. 2019). Although the use of the term in a socio-political context bears some similarities to how it is used in law (see Solum 2004),

meaning an individual's right to transparent and lawful proceedings, for the use in hydropower development, or energy development in general (Sovacool et al 2017), the meaning needs to be adapted. Here, the meaning of the term procedural justice can be described as the population's right to access procedures that affect their livelihood. This includes, for example, participatory rights to planning committees, accessible information, transparent procedures. At times, recognition is also included in procedural justice (Karjaleinen & Järvikoski 2010). In (very) simple terms: People need to have a say about their future. While empirical studies on procedural justice in renewable energy development are quite rare, they do exist (see for example Tabi & Wüstenhagen 2017, Zhao et al. 2020, Mayer et al. 2021) and have even increasingly been given attention due to the growing concerns about social impacts of energy development (see Chapter 2.4). These studies frequently employ social justice concepts like procedural justice to model acceptance of energy development projects, sometimes in combination with analyses of local identity (see Marques et al. 2015).

The introductory citation to this chapter by Tyler (2004) already hints at why justice concepts are popular in energy development literature: they can be utilized in peace processes. In fact, it seems only logical that if people are treated justly, the risk of conflict would be reduced. Furthermore, if there is empirical evidence of conflict, does it also allow to draw the conclusion that there is a rather high probability of some form of injustice occurring somewhere along the development processes? As objectively logical as they might sound, due to the sophisticated nature of conflict outbreaks, backing up these claims with sound empirical evidence is enormously difficult. Still, the plenitude and complexity of conflict drivers is not the sole issue. It is also tricky to operationalize procedural justice, as what is *just* is inherently subjective. There certainly exist laws on a national and international level that clearly define what is just and what is not, but frequently they lack robust legislation on the areas in which procedural justice is needed the most. In effect, the "*absence of domestic policy is a policy by default"* (Cernea 1997: 13). Displacement through industrial ventures or energy development provides an excellent example of this *"policy vacuum"* (ibid.: 12), as in many cases independent recommendations on regulatory policies are disregarded (ibid.), unsurprisingly leading to negative outcomes for the affected population. Considering that participation in the planning of development processes is commonly actively discouraged (Mayer et al. 2021), procedural justice could be a key factor in (co-)determining the harmfulness of the outcome of development projects.

3 Variables and Hypotheses

The previous chapters have given an essential outline of displacement, hydropower development and procedural justice and their relevancy to the field. Together with the term "harmfulness", a concise framing into variables is now needed for later use in hypotheses. Furthermore, it facilitates case selection enormously, as through distinct definition of variables it becomes more clear which cases even need to be considered.

3.1 Displacement through hydropower development

For the independent variable, displacement through hydropower development, the definitions of chapters 2.3 and 2.4 will be adapted. The displacement does not need to be involuntary, nor will the distance of displacement be considered. Therefore, the variable covers all cases, in which one or more humans leave their homes or abandon their centre of life because it has become unviable through the construction of a hydropower plant. Consequently, even voluntary resettlement will be considered under the term displacement, if the other conditions are fulfilled. This breaks somewhat with the current use of the term in literature. Even though the terms for different types of human movement are often used in a *"comparable fashion"* (see chapter 2.3), it generally makes sense to differentiate at least between voluntary and involuntary migration. Nevertheless, in order to avoid confusions from excessive technicalities and to keep theoretical arguments uniform, in this chapter and in chapter 5, the term displacement will be used predominantly. In chapter 6, a differentiated understanding of the types of displacement will indubitably be necessary again.

3.2 What defines harmfulness?

Defining the dependent variable, on the other hand, once again proves difficult. In a similar way to the challenges of characterizing justice outlined in chapter 2.5, defining what is *harmful* is equally subjective. To make an operationalization of the variable possible, selected adverse impacts of displacement will be considered to identify harmfulness. In this context, Ide's six Ds (2019b) become helpful. If, after the displacement has occurred, one or more of the remaining five Ds emerge, the outcome is considered harmful. Additionally in line with published literature Cernea 1997, World Bank 2001) economic hardship (i.e., poverty), loss of cultural identity as well as dispersion of communities are also considered harmful outcomes. In summary, the outcomes listed above could constitute eight indicators of harmfulness of displacement (in no particular order): *Depoliticization, Discrimination, Deterioration into Conflict, Delegitimization of the State, Degradation of the Environment, Economic Hardship, Loss*

of Identity and Dispersion of Communities. At this point, it is necessary to reiterate the point made at the beginning of the paragraph: What is *harmful* is subjective. Therefore, no attempt will be made to arrange the above list in order of harmfulness. For the purpose of this work, an outcome is considered more harmful, the more of the mentioned indicators are present at the same time.

3.3 The moderators: procedural justice and compensation

Procedural justice is employed as a moderating variable, also called a moderator (see Baron & Kenny 1986). Through the use of a moderator, the strength of the relationship between independent and dependent variable can be characterized. Previous chapters have already outlined how displacement can cause adverse effects in the affected population (see chapters 2.1, 2.3, 2.4). This work hypothesizes (see 3.4), that procedural justice can lessen the strength of the link between displacement and adverse effects, thus limiting or mitigating its harmfulness. It should be noted here that, in this work, not the adverse effects are the dependent variable, but the harmfulness of the adverse effects. Furthermore, unlike often the case with moderating variables, this work will not employ any quantitative-statistical methods like regression analysis. How can procedural justice then be operationalized? Primarily, through anything indicating a consistent upholding of due process, established regulations and law. Secondly through an active participatory involvement of the affected population. Examples of involvement can range from the mere relaying of information to the general population to the delegation of decision-making capacity to local communities (Mayer et al. 2021). This applies especially in a reverse context: procedural injustice is present, if the affected population is actively denied participatory rights (including suppression of demonstrations, civil assemblies etc.). Furthermore, indicators like transparency and democratic organizational structures (for example in planning committees, assessment committees) can point to procedural justice. Unfortunately, unlike in the case of the dependent variable, it makes little sense trying to standardize the indicators for procedural justice, as they will vary from case to case. Therefore, in chapter 6, adequate reasoning will be provided as to why procedural justice was present or absent in each case.

While compensation does not directly fall under the concept of *procedural* justice, it does belong into the larger field of justice concepts covered by social justice or even energy justice (see chapter 2.5). In hydropower development, the affected population is sometimes compensated for the social and environmental impacts caused by the development (see for example Ty et al 2013). In that regard, compensation refers to *social* compensation. However, forms of *environmental* compensation do exist (see Yu & Xu 2016), where environmental

impacts (often carbon emissions) in one location are sought to be compensated in another. For this work, both social and environmental compensation are of interest to the hypotheses. In the next chapter, it will be argued that *fair* compensation, much like procedural justice, can mitigate the harmfulness of displacement through hydropower development. Again, the subjectivity of the term "fair" needs to be pointed out, bearing strong similarity to the normative character of justice (see chapter 2.5). In fact, referencing to Mayer et al. (2021), procedural justice was described using the concept of fairness (ibid.). What might seem fair from one perspective may not seem fair from a different standpoint. This is demonstrated by an easy example of compensation for land (or asset) loss in hydropower development. Thinking purely objectively, a displaced person should only be reimbursed for asset loss to which they can claim legal rights. This would prevent people from demanding compensation for the loss of assets they do not actually (legally) own. On the other hand, in areas in which hydropower is likely to occur, that is, rural areas sparsely populated by mostly economically vulnerable people, land claims often follow a "*customary*" or "*traditional*" understanding of ownership (World Bank 2001). In that sense, they do not technically possess the legal rights to the land which they have been living on or which they have been cultivating for years, decades and centuries. Indeed, the World Bank manual on involuntary resettlement actively encourages the analysis of the respective legal framework(s) *"*[…] *for recognizing claims to legal rights to land—including claims that derive from customary law and traditional usage"* (ibid., Annex A) to assess whether or not a person qualifies for *"benefits"* (compensation) (ibid.). This highlights why a differentiated understanding of fairness is necessary on a case-by-case basis when considering compensation.

3.4 Hypotheses

This work argues that procedural justice can have a positive influence on the harmfulness of negative effects of human displacement through hydropower development. This hypothesis was derived from the extensive literature research done for this work. From a purely logical perspective, this suggested correlation makes sense: given the chance to decide over their own fate, people will likely choose the best or most harmless alternative. A community will presumably fare better if given the option to voluntarily resettle in a potentially predeveloped area, as opposed to being forcibly dispersed. Therefore, the following hypothesis is proposed:

H1: *Displacement through hydropower development is generally less harmful to the affected population the more procedural justice they are given.*

Furthermore, a second, very similar hypothesis is presented, arguing that fair compensation for displacement reduces its harmfulness:

H2: *Displacement through hydropower development is generally less harmful to the affected population the more social and environmental impacts are compensated for.*

The causal relationships of these hypotheses are portrayed graphically in *Figure 2.* As justice increases (and displacement "decreases"), harmfulness decreases.

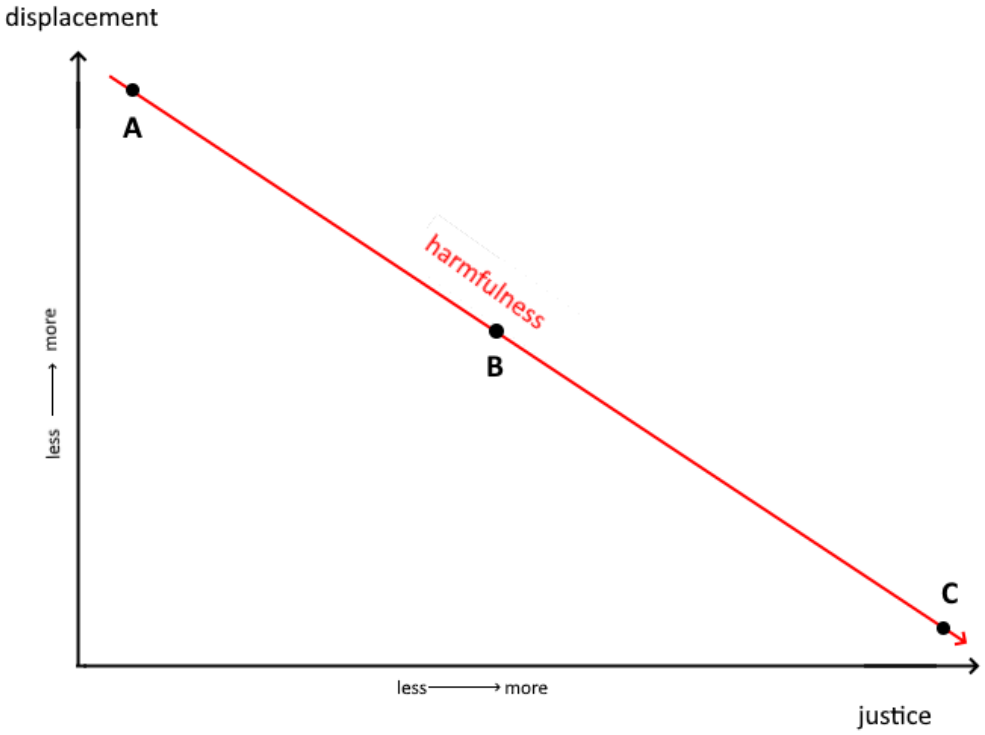

Figure 2: Presumed correlation between harmfulness of displacement and procedural (social) justice: the more justice is given, the less harmful the outcome. Point A symbolizes a (fictional) worst-case-scenario with large displacement and next to no justice, which leads to high harmfulness. Point B symbolizes a "moderate" case, where some amount of justice mitigates the harmfulness, and point C a best-case-scenario, in which displacement is absent.

Note that the y-axis (displacement) in *Figure 2* is also labelled "*less → more*", indicating that farther displacement or displacement on a larger numerical scale could correlate with harmfulness as well. However, no such distinctions will be made in the discussion of the cases, and displacement will be treated as a dichotomic variable, which in pragmatic terms means that either there is displacement, or there is none. Unfortunately, due to the case selection process, which prioritizes a larger number of displaced (see chapter 4), the scenario at point C becomes an edge case, meaning rarely occurring and barely considered. In chapter 4, an attempt will be made to compensate for this by reflecting on an "extra" case where hydropower development has been continually staved off for years through active, frequent and staunch participation of the affected population.

4 Methods

When it comes to the relatively niche field of socio-political academia studying links in the climate-conflict-nexus, small-n case-study comparisons are relatively common. Nevertheless, large-n studies like for example Ide's QC-Analysis on the effectiveness of peacebuilding (Ide 2018) have also been done. Generally, qualitative methods and mixed-method approaches are chosen more often than purely quantitative work. One lesser-known reason for this might be that quantitative data repeatedly proves to be unreliable or untrustworthy, changing throughout the project cycle (see Kirchherr et al. 2019). This case study employs a "Most Similar Systems Design" after John Gerring (2008). The general principle of the MSSD is selection cases that differ only regarding the dependent variable and are otherwise as similar as possible. Selecting Cases for a "Most Different Systems Design" (MDSD) would also be possible but was not chosen as it would require the elimination of *"necessary Causes"* (ibid.: 673), which is only appropriate in the context of *"causal uniqueness"* (ibid.: 674).

After the cases are selected, they are compared and examined for differences in the dependent variable in chapter 6. Needless to say, due to the limited scope of this thesis, it was not possible to aggregate own quantitative or qualitative data through questionnaires or interviews with locals. Therefore, the case comparison must rest on data collected from published case studies and single case analyses, newspaper articles, company reports and alike. While identifying cases on a shared independent variable (displacement through hydropower development) is rather straightforward, establishing differences in harmful outcomes proves to be difficult. This is due to the diverse methodology used (if any) in the source papers, which often have the same baseline in displacement, but look for different outcomes.

5 Case Selection

In the above chapters, the criteria chosen for case selection were already hinted at, but not yet concisely defined, nor were limitations of the case selection process addressed and legitimized. In this chapter, the factors that need to be considered for case selection will accordingly be elaborated. Cases fitting the scope of this work will then be identified for the consequent discussion in chapter 6.

5.1 Geographical limitation

For several reasons, only cases of displacement through hydropower in Brazil will be considered in the case selection. Firstly, Brazil meets virtually all criteria (as already outlined in chapter 2.4) that make hydropower attractive to private and state investors. It is rich in water resources, evidently in the amazon region, but also in other parts of the country like the mid-west and south-east (see de Souza Dias et al. 2018). It has a strong interest in solidifying its energy security, especially as Brazil's industrial sector continues to flourish, its population number grows and the nation's significance as a global player increases. Nevertheless, through the continued industrial expansion, especially in the amazon rainforest, Brazil's environmental policies come under international scrutiny more frequently. This puts additional pressure on policy makers to expand on green legislation, for example further incentivizing investments in hydropower. Secondly the geographic proximity of the cases increases the internal validity of the study. While Brazil is by no means a small country, nor particularly culturally or ethnically homogenous[12], a case comparison between two Brazilian cases makes far more sense than attempting to compare one to a case study from countries like the Congo, Laos or China, which all have their additional regional quirks, cultural uniqueness and geographic particularity. Finally, due to the author's knowledge of both Portuguese as well as Spanish, Brazil was chosen as an appropriate country for case selection.

5.2 Choosing the numbers

When it comes to case selection of displacement through hydropower development, several numerical breakpoints are often identified in literature. In the opinion of the author, some of these identifiers make more sense than others. The most obvious criteria might be the total number of people displaced in the hydropower venture as well as the distance of the displacement. Even so, cases with small "amounts" of displacement should not be portrayed as less (ethically) relevant, but as less statistically significant. For the purposes of this work's case selection, the threshold of at least 4000 people displaced will be adapted from Cernea (1997). Other numerical limits that have often been considered in literature are distance of displacement, reservoir volume, powerplant output capacity (installed capacity) and curiously, dam height. García et al. (2021) argue that the installed capacity of a hydropower plant matters, *"because project authorities prioritize the technical and economic rationality of decision*

[12] During the conceptualization phase of this work, it was even considered to only focus on Amazonian cases in Brazil due to the cultural and socioeconomic divide between Brazil's northern and southern regions. This was later dismissed in favour of including cases from all over Brazil.

making over ethical and social concerns" (ibid.: 4). This means that the larger the output capacity of the hydroelectric plant is, the more likely it is that social impacts get overlooked because of the economic energy benefits provided through the powerplant. Luckily, in most cases, the larger installed capacities coincide with larger displacements, which is logical given that a more powerful hydroelectric plant will likely need a larger reservoir. However, the other indicators mentioned above will not be considered in the case selection of this work.

5.3 Data availability

A major frustration in the case selection of this work is the lack of an up-to-date overview on hydroelectric powerplants in Brazil which includes the scale of displacement (number of people displaced) for each case. The existing collections (see for example de Sousa Dias et al. 2018) are however frequently sorted by installed capacity, which, as outlined in the previous paragraph, often coincides with large displacement. Although Cernea (1997) provides the most comprehensive overview, in 25 years since the publication of the paper, much has changed. The problem is not so much that data would be outdated (which only applies to which projects are still under construction or in planning), but (as outlined in chapter 2.4), hydropower development has been accelerating rapidly through increased public saliency of global environmental issues. Consequently, a lot of new data is missing from Cernea's overview.

Another important consideration to make is the media impact of the displacement processes in cases as well as the general availability of data (see 6.2 for a more elaborate explanation). While selecting for cases in line with the methodology described in chapter 4, a considerable amount of hydropower projects was deemed not suitable because of the astounding lack of data. Take for example the case of the Itumbiara Dam, the second largest dam (in terms of installed capacity) listed by de Sousa Dias et al. (2018). Bilingual searches on the displacement caused by the construction of the dam, in both English and Portuguese in databases like Google scholar, brought up very little few results, if any. A report by Furnas Centrais Electricas to the World Bank (FURNAS 1986) only declares: "*FURNAS prepared and executed a resettlement plan for the population displaced by the formation of the Itumbiara reservoir*" (ibid.: 10), without actually providing any more data, references to said resettlement plan or even the resettlement itself.

Carefully considering the concepts, ideas and problems outlined in this chapter, three cases were chosen for analysis: the Castanhão dam in Ceará, the Belo Monte Hydropower Project and the Tucuruí dam in in Pará.

6 Results

In this chapter, the cases mentioned in the chapter above will first be presented and then their outcomes will be compared. Of course, this takes place in the context of the hypotheses outlined in chapter 3.4, which will be discussed.

6.1 Findings from the cases

The following three segments elaborate on the cases selected in chapter 5.

6.1.1 Castanhão

"Castanhão" is the name of the largest multiple-use dam in Brazil[13]. Completed in 2003, it serves the purpose of water distribution, principally to solve water scarcity conflicts about irrigation in agriculture (Salinas et al. 2019), and further houses a hydroelectric plant which provides the region with electricity. The construction of the dam displaced an estimated 11000 people. (Bartolome et al. 2000).

In 1995, during the planning period for the dam, a *"Multi-Participatory Working Group of the Castanhão Dam"* (ibid.: 43) was established. The purpose of this group was to share information between the general public and the different organizational bodies involved in the construction of the dam, settle disputes over displacement (resettlement) and compensation, increase transparency of government acts on displacement, and creating a forum for open participation in the planning process (ibid.). Scholars soon recognized the potential of integrating affected communities into decision-making procedure: *"Reflecting the need to implement non-authocratic* (sic!) *'top-down' approaches, a full-fledged participation of the public in the planning and decision making process is becoming mandatory and should become widespread"* (Beekman 2002). The working group, which relies on democratic structures and principles, further serves the crucial role of balancing the unjust power dynamic between the rural population and the government (Bartolome et al. 2000).

Even though, according to a blog entry from 2016[14], conflicts on territorial claims are not solved fully, there is very little evidence in literature on large-scale adverse social impacts of the displacement through the construction of the dam. However, Salinas et al. (2019) note that the overall well-being did not improve substantially, even though water availability was

[13] https://web.archive.org/web/20150923215516/http://www.dnocs.gov.br/barragens/castanhao/castanhao.html, last on 01.07.2022.
[14] http://mardoceara.blogspot.com/2016/03/a-historia-do-acude-castanhao.html, last on 01.07.2022.

not an issue anymore. Due to severe droughts in recent years[15], water scarcity could become problematic once again.

6.1.2 Belo Monte

The Belo Monte Hydroelectric Complex, developed by Norte Energia in the state of Pará, was first put into operation in 2016. According to the social impact assessment (SIA) done prior to construction in 2009, the project was expected to displace around 20000 people, although a later panel of experts concluded that the true displacement potential could be almost double the original estimate, up to 40000 people (Randell 2016). The Belo Monte dam is close to the urban centre of Altamira, which has a population of more than 100000 people. This highlights once again how initial estimates for factors like displacement or cost of construction are consciously kept low to not jeopardize the process of licensing the development project (see Kirchherr et al. 2019, Mayer et al. 2021). Although the planning of the Belo Monte dam began as early as the 1970s, construction began only in 2011 due to the contention of the project through local and indigenous population, environmental and social activists and NGOs (Randell 2016). Around 2014, an estimated 22000 people began their resettlement, which for the first time would fall under Article 169 of the International Labour Organisation (Mayer et al. 2021). This Article requires that *"builders of dams have open and free consultation with traditional and indigenous populations"* (Mayer et al. 2021: 2). However, in the case of Belo Monte, these consultations were *"poorly executed"* (ibid.: 3) and did not meet the necessary requirements because the developing parties were already in a hurry to begin construction of the project (ibid.). This is a first hint to a violation of procedural justice. Additionally, Weißermehl (2021) argues that Norte Energia's strategy of dispersing *"communitarian"* (ibid.: 94) structures of the local population through selective resettlement could be seen as an attempt to discourage organized resistance against the Belo Monte project. This scattering of established communities and the subsequent breaking up of habits also led to loss of identity on an individual level, with one woman comparing the displacement process to *"moving from the favela into misery"* (ibid.).

In terms of compensation, through the *Plano Básico Ambiental (PBA),* or the Basic Environmental Plan developed by Norte Energia, the population affected by the construction of the Belo Monte dam could receive generous compensation (Randell 2016, Mayer et al. 2021), mostly in the form of monetary compensation that scaled with the estimated worth of the lost assets (Randell 2016). People that were not landowners or at least had no legal ownership over

[15] https://g1.globo.com/economia/agronegocios/globo-rural/noticia/2018/01/volume-do-acude-castanhao-no-ceara-bate-recordes-negativos.html, last on 01.07.2022.

land were provided with a credit for around $US 65000 to invest toward new land. However, latently affected communities like downstream fishing villages had little to no access to compensation (Mayer et al. 2021). Furthermore, specific non-material losses like the loss of social capital are hardly ever compensated for.

The construction of the Belo Monte dam and the subsequent resettlement have also had devastating environmental effects, including the contamination of ground water (ibid.). Furthermore, in urban centres, violence and insecurity increased (ibid.). This constitutes two additional adverse effects of displacement, thus (technically) increasing overall harmfulness, as outlined in chapter 3.2. Interestingly though, Randell finds an overall improvement in well-being, especially among those of the displaced population who remained in a rural area nearby and did not have to give up on their social networks (Randell 2016).

Summarizing: Although procedural justice was at least in parts impeded during the development of the Belo Monte hydropower plant, adverse impacts of displacement like crime rate or degradation of the environment did not seem to increase in harmfulness. However, the avoidance of dispersion and loss of identity seem to contribute to the improvement in well-being. This could suggest that, as loss of social "assets" often remains uncompensated, they can contribute to the overall harmfulness of the displacement.

6.1.3 Tucuruí

The Tucuruí dam is located along the river Tocantins in the state of Pará. Because Eletronorte, the company that constructed the dam and operates the hydropower facility at Tucuruí, did not consider social impacts in its original assessment of the project location, estimates on displacement severely underestimated the actual number (Fearnside 1999). Through the dam construction, about 24000 people were displaced (3600 of the displaced filed for damages after the resettlement), surpassing the original estimate of 9500 people twice (ibid.). Apart from the grave ecological consequences of the Tucuruí dam construction (see Fearnside 2001), the hydropower development had considerable harmful social effects. The displaced people(s) and Eletronorte entered a seemingly unresolvable conflict (Fearnside 1999), caused by the inability of Eletronorte to handle a resettlement of this scale (Acselrad 1991). Furthermore, the development was heavily geared toward multinational industrial investors like aluminium mining companies (Fearnside 2001), disregarding concerns on environmental and social impacts.

In the case of Tucuruí, both procedural justice and fair compensation are basically absent. After 3700 people had been resettled onto a new site, due to an error in the calculations of Eletronorte, their resettlement site got also flooded (Fearnside 1999). Several groups of people

were excluded from resettlement planning or compensation because they did not fit the narrow description of Eletronorte. For example, the population in an adjacent floodplain had to also be resettled because Eletronorte had not considered seasonal flooding (ibid.). The poor planning of the flooding process led to the rapid spreading of disease like Malaria due to favourable conditions being accidentally created by the flooding (ibid.) Indigenous territories were not only flooded, but the remaining parts segmented through the construction of high voltage power lines and reused for the resettling of non-indigenous local population (ibid.). Large parts of the (cheaply) produced electricity were not even returned to the population as a form of benefitting from the hydropower development, but the energy was used for the industrial mining of aluminium, which in turn only created more environmental damage (ibid.). Compensation for asset loss and resettlement was sometimes awarded, but only in small amounts of cash, often late and completely without guidance on monetary use (ibid.) This is only a short synthesis of Fearnsides lengthy analysis of the disastrous conduct by Eletronorte. In a later paper (Fearnside 2001), he highlights the role of scientific research and due processes in preventing adverse outcomes (ibid.). Interestingly, he also emphasizes the need of public discourse to put pressure on authority figures to take interest (ibid.). Fearnside comes to a generalized and bleak conclusion: *"The need for fully informed public discussion of the ambitious hydroelectric plans that have been made for Amazonia is urgent. Unfortunately, many of the lessons of Tucuruí have not yet been learned"* (ibid.: 393).

6.2 Page not found – Esta página não existe

During the research and literature review for this thesis, time and again the search for more sources or newer data ended on webpages apologetically displaying "This page was not found" (or the Portuguese equivalent: "Esta página não existe", literally: "this page does not exist"). This was not limited to small personal websites, no longer regularly managed webportals or long outdated datapools, but frequently occurred with websites of banks, governments, NGOs and even some scientific journals. For example, the main data source for specifications of hydropower projects referenced in de Sousa Dias et al. (2018) points to a webpage of the Brazilian Energy Ministry, which is not online anymore[16]. Together with the unfortunate practice of locking scientific journals and articles behind paywalls, this severely hindered the possible quality of literature work for this thesis.

[16] Link provided by de Sousa Dias et al.: http://www.mme.gov.br/documents/1138769/2252804/Energia+Hidráulica+em+2014.pdf/a4f31f91-1737-4f3b-85fb-f960706d0c56, (not working!) last on 01.07.2022.

7 Conclusion

Unfortunately, the assessment of these three cases presents itself confusing. There cannot be drawn a clear conclusion for validity of the hypotheses outlined in chapter 3.4. In chapter 6, three cases were presented that in parts do support the argument that procedural justice and fair compensation influence the harmfulness of displacement. The extreme case of Tucuruí shows that in the absence of both, an enormous power imbalance is created, and adverse social and environmental results mount. In the Castanhão, through the creation of a functioning and active participatory (control) instrument, the sharing of information and the active involvement of the population in decision making on resettlement and compensation, most negative outcomes were seemingly avoided or mitigated, thus limiting harmfulness. However, the case of Belo Monte appears to break with this correlation: Even though there are clear indicators of unfair compensation and violation of procedural justice, the study done by Heather Randell (2016) finds that the majority of the displaced population has seen an increase in well-being. The Belo Monte case study outlines a different key player in whether or not displacement was harmful: social networks and reliance on habits.

Going forward, a lot more up-to-date case study work and quantitative data is necessary to identify drivers of adverse social and environmental impacts. After all, there is enough evidence to hint at a correlation between justice, compensation and harmfulness of outcomes. An interesting case not considered in this thesis is the one where displacement has not yet occurred, perhaps due to diligent efforts in keeping justice. One such case could be the quilombo-population of Cachoeira Porteira north of Porto Trombetas. Even though Cernea (1997) already identified the region as a potential site for hydropower development, as of the writing of this thesis almost 25 years later, the site has still not been licensed for construction. Avoiding the displacement entirely certainly (almost) guarantees freedom from its harmful impacts.

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