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CHAPTER 1

Introduction¹

The planning and construction of dams is not a new phenomenon. Understood broadly, a dam is a barrier that is built to hold back water and raise its level, either to provide water resources (for agriculture or cities) or to generate energy. However, both historically and in the contemporary context, the dams of the world are linked to broad questions of how we use and manage water resources. Dams are understood to have been built over 8,000 years ago in Mesopotamia, channelling waters from the Tigris and Euphrates in modern-day Iraq to irrigation networks. The Roman Empire consisted of more than just aqueducts, bridges and roads to Rome – dams were also constructed in North Africa and modern-day Spain to ensure a continuous supply of water to the baths, latrines and fountains of urban centres. The Roman-built Cornalvo dam, located in the Badajoz province of western Spain, now a UNESCO heritage site, is still in use – its earth and stone cladding are understood to date back to the first or second century AD.

The 20th century saw unprecedented levels of development of water infrastructure, both in scale and scope. From the canalisation of the isthmus of Panama to the iconic concrete structures of the Hoover, Grand Coulee, and Glen Canyon dams of the American West, states turned to massive infrastructure projects to redirect water to meet agricultural and urban demand or to generate hydroelectricity by manipulating a river's flow. The commitment to dam construction continued into the late 20th century, with the Itaipu (joint project by Brazil and Paraguay), Sayano–Shushenskaya (modern-day Russia) and Atatürk (Turkey) dams all representing the 'Promethean impulse' that characterised water engineering as a route of societal progress (Gandy, 2014, p. 10).

At the turn of the new millennium, the World Commission on Dams (WCD), a multi-stakeholder consultative body formed by the World Conservation Union and World Bank, published a set of wide-ranging guidelines for planning and building hydroelectric dams in the 21st century in response to growing resistance to – and popular disapproval of – large hydroelectric projects. The WCD was formed in May 1998 to review the effectiveness of dams in achieving economic and development goals. The Commission, chaired by Kader Asmal and including members of industry, civil society and government among its number, examined over 1,000 dams in 79 countries, interviewing 1,400 stakeholders and commissioning 130 technical papers. The publication of the World Commission on Dams report in 2000 represented a low point for the global dam-construction industry. After several years of research, the Commission concluded that:

Dams have made an important and significant contribution to human development... [but in] too many cases an unacceptable and often unnecessary price has been paid to secure those benefits, especially in social and environmental terms, by people displaced, by communities downstream, by taxpayers and by the natural environment.

(World Commission on Dams, 2000, p. xxviii)

The Commission put forward a framework consisting of seven strategic priorities and 26 'guidelines for good practice' - that aimed to improve the development outcomes of future hydroelectric dam projects. These ranged from the need for increased transparency and participation in the planning process and the payment of compensation to those impacted to the requirement for a basin-wide assessment of the potential impact on ecosystem health and biodiversity in the region (World Commission on Dams, 2000)

Yet, despite vocal criticism of these projects by the WCD and others (McCully, 1996; Scudder, 2012), the construction of hydroelectric dams has continued. From the Three Gorges Dam on the Yangtze river in Hubei Province, China, to the Grand Ethiopian Renaissance Dam that spans the Blue Nile in Ethiopia,

¹ This is a copy of Chapter 1 of *Contesting Hydropower in the Brazilian*, published by Routledge in 2020. It is for archiving purposes and is the final version of this chapter before publisher copy editing, formatting, and styling.

these projects continue to have a traumatic impact on both those who are displaced or see their livelihoods disrupted and the morphology, biodiversity and ecosystem health of the river basin itself. More than half of the 292 large river basins globally have been dislocated by hydroelectric infrastructure, including 45,000 large dams (Nilsson et al., 2005; Baghel and Nüsser, 2010). Although hydroelectric dams may have appeared to be under fire in 2000, they have enjoyed a global resurgence in the decades since. As of 2019, total global installed capacity of hydroelectricity-generation stood at 1,307 gigawatts (GW) (International Energy Agency, 2019a)

This book explores this resurgence of dam construction in the 21st century by focusing on two projects in the Legal Amazon Region of Brazil¹ - namely the Belo Monte and São Luiz do Tapajós dams. Both projects are located on tributaries of the Amazon river (the Xingu and Tapajós rivers respectively), both have large energy generation capacities (11,233 and 8,040 megawatts [MW] respectively), and both have been subject to periods of contestation by multi-actor resistance coalitions. However, while Belo Monte has entered into operation, the São Luiz do Tapajós project was 'archived' (a term used to describe a project's removal from national energy plans) in August 2016, following the demarcation of the Sawré Muiybu indigenous territory of the Mundurucu community. Both the Belo Monte and São Luiz do Tapajós dams represented constituent parts of the dam-building programme of the government led by the Partido dos Trabalhadores (Workers' Party, PT) that held power in Brazil from 2003 to 2016. During this period, Presidents Lula Inácio da Silva (2003–2011) and Dilma Rousseff (2011–2016) enacted a series of policy packages centred on stimulating economic growth through the construction of infrastructure, progressive social policies and the championing of domestic companies within international markets (Casanova and Kassum, 2013; Hochstetler and Montero, 2013). A centrepiece of these policies was the 2007 *Programa de Aceleração do Crescimento* (Growth Acceleration Programme, PAC) and its successor plan, the 2010 *Programa de Aceleração do Crescimento* (PAC-2). The Belo Monte project secured investment in the 2007 PAC, while the São Luiz do Tapajós project was present in the 2010 PAC-2. At the time when they were planned, these projects were two parts of an extensive programme of dam building in the Legal Amazon Region that has taken place in Brazil over a number of decades. As of 2016, the Belo Monte and São Luiz do Tapajós projects were two of 79 dam projects planned for the lower and middle parts of the Amazon Basin (Lees et al., 2016).

Dam construction in Brazil is not a new process. The (now-decommissioned) Marmelos Zero dam on the Paraibuna River, Minas Gerais, was built in 1896. The majority of Brazil's dams are earth-filled embankment dams, built to provide freshwater storage as a means of minimising the effects of droughts linked to the El Niño phenomenon (Brazilian Committee on Dams, 2009). Until the 1950s, most hydropower plants were small, privately-owned facilities that provided limited output. During the military dictatorship (1965–1984), the exploitation of hydropower accelerated in a context in which extensive economic growth (itself underpinned by cheap energy) was an important legitimising strategy for the military regime. The 1960s witnessed the commissioning of the Furnas Dam (completed in 1963) and Peixotos Dam (1968) on the Rio Grande, and the Três Marias Dam on the São Francisco River (1961), all in Minas Gerais. The following decade saw the construction of a number of large dams, such as the Jupia Dam (now the Engineer Souza Dias Dam) that blocked the Paraná River in Mato Grosso do Sul, creating a reservoir with a surface area of 330 km². 91 dams were built in the 1970s, with this number including the Marimbondo (Minas Gerais), the Capivara (Paraná) and the Paulo Afonso Hydroelectric Complex in Bahia. 60 such structures were built in the 1980s (including the iconic Itaipu on the Paraná River), and fewer than 30 in the 1990s (Khagram, 2004). The 21st century witnessed numerous projects built to provide hydroelectricity, including the Barra Grande (in Santa Catarina/Rio Grande do Sul state, completed in 2005), the Irapé (Minas Gerais, 2006), Campos Novos (Santa Catarina, 2006), Mauá (Paraná, 2012) and the Simplício (Rio de Janeiro/Minas Gerais, 2013) dams. Dams built in the Amazon region include the Santo Antônio and Jirau dams (Rondônia, 2012 and 2016 respectively), Teles Pires (Mato Grosso/Pará, 2016) and Belo Monte (Pará, 2016) complexes. Contemporary dam-construction efforts may be less monumental now than they were in the age of Itaipu and Tucuruí, but they are just as

large (Belo Monte will have an energy generation capacity of 10,233 MW) and expensive as before, with respective budgets calculated in the billions of Brazilian *reais* (R\$).

Pro-dam actors increase the legitimacy of a dam project by presenting it as a solution to various issues, previously seen as distinct from the building of this infrastructure project (Warner, Hoogesteger and Hidalgo, 2017). To gain this support, storylines that accompany hydropower projects co-opt pre-existing demands (such as for employment, energy security or secure water supply) as justifications for a dam project. For example, assertions related to energy security in contemporary pro-dam storylines represent the absorption of popular demands for a secure and affordable energy supply to generate consent to – and to legitimate – the project in question. It is by absorbing these additional popular demands that the pro-dam actors position the hydropower projects they support as indispensable to ensuring future energy security, maximising the number of supposed beneficiaries of the project (with the promise of energy security extended to various constituents) and appealing to fears of a loss of power (Atkins, 2017). In doing so, the infrastructure project is presented as a key part of national economic and energy policy agendas.

In subsequent chapters, I focus on an emerging storyline of legitimacy, one which presents hydropower projects using the language of sustainability (Ahlers et al., 2015; Bratman, 2015; Atkins, 2018b). While the promise of economic development has in the past provided a legitimising storyline for historic dam projects, climate change mitigation now provides a key driver for the contemporary development of hydropower (Moore, Dore and Gyawali, 2010; Huber and Joshi, 2015; Warner, Hoogesteger and Hidalgo, 2017). I understand this as demonstrative of a *storyline of sustainability*, defined as the assertion of the perceived sustainability of the scheme and its location within contemporary sustainable energy transitions and sustainable development agendas. In the cases of the Belo Monte and São Luiz do Tapajós dams, pro-dam actors have argued that contemporary hydropower projects in the Legal Amazon Region represent ‘clean’ energy that contributes to Brazil’s sustainable development agenda. For example, at a 2010 rally in Altamira, President Lula Inácio da Silva (2003–2011) asserted the need to ‘use clean energy and preserve the environment. This is my commitment’ (da Silva, 2010). The Brazilian government sponsored a set of billboards in Rio de Janeiro, timed to coincide with the 2012 United Nations Conference on Sustainable Development, that portrayed the Belo Monte as ‘clean energy’ (Bratman, 2015). With a majority of the Brazilian population reporting a concern with environmental protection and health (Ministério do Meio Ambiente, 2012), these statements appeal to a ‘moral legitimacy’ in which the project is located within the dominant value system of the time (Bezerra et al., 2014). I argue that this represents the absorption of new elements into pro-dam storylines, with the infrastructure project taking on a new meaning as a constituent part of sustainable development and climate change mitigation agendas.

The energy landscape of the 21st century is rapidly changing, with renewable energy sources – such as wind power, solar power and hydropower – representing significant proportions of energy matrices across the globe. While policies related to energy efficiency are often present, the dominant mode of contemporary discussions of Sustainable Energy Transitions is the decarbonisation of the energy supply – or the reduction of the carbon dioxide emissions associated with energy production. A key factor in the characterisation of hydropower as *sustainable* is its assumed role in schemes of climate change mitigation, with proponents of dams arguing that large dams emit relatively low levels of greenhouse gases (GHGs) when compared with fossil fuel energy sources (Biswas and Tortajada, 2001; Altinbilek, 2002; Berga, 2016). For example, Berga (2016, p. 313) describes hydropower as a ‘clean, renewable and environmentally friendly source of energy’. After characterising hydropower as both ‘clean’ and ‘environmentally friendly’, Berga goes on to argue for the importance of this energy source in climate change mitigation and sustainable development (Berga, 2016). This is despite research linking hydroelectric dams – and their reservoirs in particular – to emissions of methane gas into the atmosphere (Giles, 2006; Delsontro et al., 2010; Marcelino et al., 2015). While carbon dioxide is released by vegetation protruding above the water level, the decomposition of plants and trees below the surface

creates methane. This gas is subsequently released when it is processed by the turbines. Worryingly, methane can have 20 times the warming potential of carbon dioxide – a key GHG in climate change mitigation agendas – over a 100 year period (Giles, 2006). Despite this, the mitigative potential of hydropower remains a key part of national and international policies, and it continues to be characterised as a ‘green’ source of energy.

A key factor in this characterisation of hydropower as a sustainable energy source is the Clean Development Mechanism (CDM), created by Article 12 of the 1997 Kyoto Protocol. The CDM was created as a mechanism for Annex I states (wealthy states, primarily in the Global North, who have accepted a maximum limit on their emissions) to provide funding for sustainable development and climate change mitigation projects in Annex II states (developing states, primarily in the Global South, without a national cap on emissions). Hydropower projects are categorised as a source of energy with low GHG emissions within the CDM and are eligible for Certified Emission Reduction certificates (CERS, carbon credits) (CDM Executive Board, 2009).ⁱⁱ As of February 2020, 2,181 hydropower projects are provided with carbon credits under the CDM (CDM Pipeline, 2020). As we move forward towards a sustainable future, this energy source is expected to play a major role in decarbonising national energy systems (United Nations Symposium on Hydropower and Sustainable Development., 2004) The IEA (2019b) has affirmed the role of hydropower in its Sustainable Energy Scenario, which outlines its vision of a decarbonised energy system and the fulfilment of the comprehensive vision and targets set out by the SDGs. Within this scenario, global hydroelectric generation must increase by 2.5% every year until 2030. With global capacity standing at 1,307 GW, this represents a growth of 32.6 GW per year. In 2018, 21.8 GW of hydroelectric capacity was put into operation globally (International Hydropower Association, 2019). As the website for the United Nations Framework Convention on Climate Change (UNFCCC) (2018) stated in the run-up to the 2018 Conference of Parties (COP) in Katowice, Poland:

The rapid and responsible deployment of clean, renewable energy is crucial to meet the goals of the Paris Climate Change Agreement, which is to limit the global average temperature so that the worst impact of climate change can be avoided, including ever more severe storms and droughts... The evolution of solar and wind energy has been the driving force of the transition to a low-carbon world in the past years, but despite the rise of new energy sources, one technology remains a cornerstone of the renewable energy mix in some regions of the Earth: hydropower.

In policy documents, the sustainability credentials of hydropower are often predicated on its characterisation as a renewable energy source. Both the 2004 Bonn International Conference on Renewable Energies and the United Nations Beijing Declaration on Hydropower and Sustainable Development have recognised hydropower as a renewable energy source with a synergistic role in sustainable development agendas. The characterisation of hydropower as renewable energy is based on the belief that water resources represent a non-finite source of energy, in comparison with the conventional fossil fuels of coal, oil and natural gas.

Sustainable development is a policy-based term that came of age at the 1992 Earth Summit in Rio de Janeiro, which is based on finding synergies between goals of economic development, social sustainability and environmental protection. It can be broadly defined using the oft-cited Brundtland definition, as representing ‘Development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (World Commission on Environment and Development, 1987). The Brundtland definition represents the paradigmatic understanding of environmental issues and possible solutions in contemporary environmental governance. This is evident in its adoption at international events, including the 1992 United Nations Conference on Environment and Development (UNCED 1992, also known as the Earth Summit) and the 2015 Sustainable Development Goals, with the asserted compatibility between economic development and environmental protection providing a dominant paradigm in contemporary environmental policy and international development. Hydropower is often discussed in relation to the policy of Sustainable Development due to its role in

simultaneously addressing issues of energy security, water (and, with it, food) security and climate change mitigation (World Bank, 2009; Berga, 2016; United Nations Framework Convention on Climate Change, 2018). Hydropower projects provide job opportunities, reduce seasonal flooding, and provide energy and water security to populations. As a result of these multifaceted benefits, hydropower has become positioned as having a part to play in the fulfilment of the 2015 Sustainable Goals (SDGs), part of the United Nations' 2030 Agenda for Sustainable Development (Lane, 2015; Berga, 2016). This is with particular reference to Sustainable Development Goal 7, which aims to 'ensure access to affordable, reliable, sustainable and modern energy for all', with hydropower providing a route to simultaneously provide energy to more and more people and reduce GHG emissions. As Tracy Lane (2015), writing for the International Hydropower Association has argued:

There is broad consensus that, when properly planned and implemented, hydropower is an affordable, reliable, sustainable and modern technology. It can help communities, nations and regions to acquire a reliable supply of electricity, supporting economic and social development throughout the world.

What could perhaps be seen as a trade-off between climate change mitigation and energy security and social development, due to the role of dams in stimulating population displacement and loss of livelihoods, has instead become understood as synergistic. The World Bank (2009) has labelled hydropower as a key facet in ensuring both poverty alleviation and sustainable development, stating that it is the 'multidimensional role' and flexibility of hydropower that assists in addressing these challenges. In 2013, Rachel Kyte, the World Bank's Vice President for Sustainable Development, argued that hydropower offered the most promising way to balance the institution's twin goals of continuing to lift people out of poverty and mitigate greenhouse gas (GHG) emissions globally:

Large hydro is a very big part of the solution for Africa and South Asia and Southeast Asia. I fundamentally believe we have to be involved. [A previous move away from hydropower] was the wrong message. That was then. This is now. We are back.

(Schneider, 2013)

The location of hydropower in these twinned policy agendas of climate change mitigation and sustainable development has accompanied – and legitimised – a resurgence of dam-construction in the 21st century. The World Bank started to provide investment to large hydroelectric dams across the globe, including projects in Nepal, Congo and Zambia, as well as technical assistance to governments building such facilities. Between 2002 and 2004, World Bank investment in hydropower projects was less than US\$250 million per year. In 2008, the figure exceeded US\$1 billion (World Bank, 2009). Numerous states have turned to hydropower expansion to increase their generation capacity and energy supply and have been able to secure international financial support. State interests are no longer only investing money in dam projects within their own countries but have regularly become involved in projects overseas. For example, as part of its 'going out' strategy, Chinese state institutions, state-owned enterprises and private companies have provided funding and support and tendered contracts for dam projects across the globe (McDonald, Bosshard and Brewer, 2009; Murton, Lord and Beazley, 2016; Siciliano et al., 2019). The global environmental organisation (EO), International Rivers has argued that just one Chinese company, PowerChina controls nearly 50% of the international market in hydropower-construction (Jensen-Cormier, 2019). In the context of these investments, global dam building has become a key site of economic cooperation among states across the Global South, with China, Brazil and India providing finance, technical assistance and tendering contracts associated with the new dams of the 21st century. Furthermore, new private actors, drawn from circuits of both regional and global finance, provide increasing amounts of financial support to dam projects (Merme, Ahlers and Gupta, 2014). For example, the Nam Theun 2 project in Laos is owned by three parties – the French energy company, EDF, the Thai Electricity Generating Public Company and the Laotian state – but is financed by a total of 27 parties from across the globe. With the emergence of these new streams of investment, many of the more traditional funders of hydroelectric dams (such as the World Bank) have taken a back seat, acting as

facilitators of funding relationships (Merme, Ahlers and Gupta, 2014) This increased investment is somewhat surprising. Hydroelectric schemes have been found to often go over-budget, with 20% of all dams built costing twice as much as first envisaged and 1 in 3 costing three times as much (Ansar et al., 2014)The Three Gorges Dam in China cost an estimated 254.2 billion yuan (US\$37.23 billion), close to five times the estimated cost of 57 billion yuan (US\$8.35 billion) first envisaged in 1992 (Reuters, 2009). However, a logic behind these new investments can be found in how private actors, in particular, are attracted to invest in hydroelectric schemes by additional incentives, such as state-promised tax exemptions and the potential to assert control over a river basin and local or regional energy grids (Merme, Ahlers and Gupta, 2014). Many of the interests in the Nam Theun 2 project in Laos were enticed to the project by a series of policy reforms completed by the Laotian government, including the relaxing of labour standards and provision of extensive tax exemptions(Merme, Ahlers and Gupta, 2014)The emergence of these new private or state–private hybrid actors into the dam-building business in the 21st century represents an important change, complicating understandings of accountability, costs and benefits, and financial risk.

Twenty years on, the World Commission on Dams has influenced contemporary patterns of large dam construction, with researchers employing innovative methods to ensure that the WCD report’s recommendations and guidelines are followed (Schulz & Adams, 2019). In response to the World Commission on Dams report, the global hydropower sector (broadly defined) has made efforts to address previous criticism of hydroelectric dams, issuing a set of Sustainability Guidelines in 2004 and subsequently convening a multi-stakeholder forum to collate, discuss and disseminate best practices. Between 2007 and 2010, a multi-stakeholder forum was formed of representatives from government, industry, financial donors and civil society actors working to create a new global framework to increase the sustainability credentials of hydropower in the 21st century. The resulting Hydropower Sustainability Assessment Protocol (HSAP) defines both good and bad practices in dam building at all stages of the lifecycle of a project (from early stages to operations) and across 24 elements, including environmental, social, economic and technical aspects. The HSAP calls for an independent review of sustainability factors, sustained and productive communication with impacted communities and reduction of the financial risks associated with overspending.

As hydroelectric dams continue to be built across the globe, their social and environmental impacts continue to proliferate. Claims of hydropower’s role in sustainability are not necessarily supported. Previous studies have linked large hydroelectric dams to numerous ecological, economic and social impacts, ranging from the disruption of fisheries, transformation of river geomorphology, and population displacement (von Sperling, 2012). Hydroelectric projects are designed to flood land, leading to a loss of biodiversity and fragmentation of habitats. They disrupt the communities living on the riverbanks, being linked not only to population displacement but also to increases in criminality and disease transmission. This results in a disconnect between the infrastructure’s classification as ‘renewable’ energy and the consequences of its construction. I follow the argument of Ahlers et al. (2015, p. 198), who stated that ‘repackaging hydropower infrastructure as clean energy is confusing the resource with the instrument: water is renewable, yet dams are not.’ While the benefits of hydropower may be multifaceted and positive in the eyes of their proponents, their impacts can be traumatic, irreversibly changing the region in which it is built.

Why how we talk about ‘sustainability’ matters

The construction of a hydroelectric dam is not a straightforward process. It represents more than mere engineering of hydrology. For a dam to be built, pro-dam actors must secure acceptance of the project from those who may otherwise oppose it. Following the work of others, I argue that to understand these moments of contestation, researchers must engage with the ways in which different actors describe a dam and endow it with meaning (Molle, Mollinga and Wester, 2009; Ahlers et al., 2014; Crow-Miller, 2015; Warner, Hoogesteger and Hidalgo, 2017). Pro-dam actors have previously legitimised dam construction in a number of ways, including notions of the ‘conquering’ of nature, hydropower as a technical solution

to socio-political problems, the role of infrastructure in economic development, dams as symbolic of a nationalist project and assertions of the economic development to be stimulated by the project's construction (Bakker, 1999a; Kaika, 2003; Akhter, 2015a). The putting forward of these legitimising discourses by pro-dam actors positions the respective dam project within a wider social, political or economic context, be it one centred around economic growth, nationalism, or the consolidation of a certain political order. As a result, the dam project in question becomes inscribed with a wider political significance, endowing it with a wider legitimacy.

The ways in which policymakers describe infrastructure, policies or problems (and solutions) position these referents within a wider context, which is linked to the previous knowledge, political affiliation, emotion, embodiment and environment of the audience (Goffman, 1974; Lakoff, 2010). To explore the importance of how both proponents and opponents of hydropower projects describe particular schemes, I draw on the concept of *storylines* (Hajer, 1993, 1995). A storyline is understood as an overarching body in which various discourses are combined into a coherent whole, with their respective complexity simplified and concealed (Hajer, 1993). The imposition and entrenchment of a storyline, which provides a means of understanding a project and its wider consequences, has a central role in the contentious interaction that surrounds the construction of a dam, presenting it as a solution to a prescribed problem or asserting a necessity of action. These storylines are provided by both pro-dam and resistance actors, with each group locating a given dam project within a wider narrative of problems, solutions and impacts. For example, historic pro-dam storylines have incorporated a variety of discourses, including those related to industrialisation, energy supply, utilitarian notions of the greatest good for the greatest number and the importance of infrastructure, into a coherent storyline that is put forward to legitimise a dam project. Although a storyline may contain a range of demands, it can become fused by a homogenising logic that presents the demands as sharing the same goal(s), coming to have what Hajer (1993) terms *discursive affinity*. Storylines that draw together assertions of economic development, statehood and nationalism or the need for an urgent solution to water scarcity appeal to these devices to simplify the debate surrounding the project by presenting it within a wider policy context based on what the country needs. Equipped with these storylines, pro-dam actors seek to impose a prescribed meaning on a dam project, overcome contestation and achieve *discursive closure*.

I understand the current storylines that locate dam projects within sustainable development and climate change mitigation agendas as a *storyline of sustainability* – that frames projects within wider concerns related to climate change mitigation and sustainable development. Rather than representing the construction of a new link, pro-dam actors present a dam as a solution to a particular problem (the need for 'sustainability'), tapping into a moral or ideological understanding of the issue and its significance (linked to either GHG-mitigation or Sustainable Development). In successfully positioning an issue in such a way, the speaker(s) delimit the routes of action available, sanctioning the dam project as a particular solution to a defined set of problems, while denying the legitimacy of others (Benford and Snow, 2002). A dam project is inscribed with a particular meaning, linked to wider demands, simultaneously legitimising a project and reducing the grounds for critique by those opposed to it.

In conceptualising the term *sustainability*, I draw on the definition provided by Arias-Maldonado (2013, p. 438) in understanding sustainability as a term that describes 'any kind of socio-natural relationship which is balanced enough to be maintained in the indefinite future'. The term is used across a variety of disciplines and in numerous contexts. As a result, the definition of the term is context-dependent, ranging from the need for sustainable yields in fishery or forestry policy to the ability of certain economic practices to persist unaided. We all have different definitions of what sustainability is and what it looks like. Such visions of sustainability are rooted in different epistemologies and worldviews, everyday experience and personal history. While these may complement one another at times, they often find themselves in conflict.

Any claim of sustainability involves a value judgement – defining a problem, a solution, which resources should be sustained and by which means (Sikor and Norgaard, 1999). As a result, the utterance of a storyline of sustainability not only functions to assert a particular vision and definition of what sustainability is, and how hydropower is located within it but also excludes other, alternative definitions that are dismissed as undesirable, culturally specific or unscientific (Redclift, 2005; Scoones, 2007, 2016; Leach, Scoones and Stirling, 2010). Within this process of exclusion, storylines of sustainability represent the differentiation between legitimate and illegitimate actors and demands. I understand this as depoliticisation. Processes of depoliticisation are defined as ‘discursive strategies in which legitimate and responsible actors’ demands are distinguished from illegitimate, irresponsible actors and unrealistic and impossible demands’ (Pepermans and Maesele, 2014, p. 223). In exploring this concept of depoliticisation, I draw from the distinction between the political and politics proposed by Mouffe (1995: 262–263). Within this reading, ‘politics’ refers to the numerous practices, institutions and acts of discourse that establish a certain order and organise society and ‘the political’ refers to the occurrence of antagonism that is present in all society, with no actor able to truly attain a fixed identity and no discourse able to fully achieve a hegemonic position (Mouffe, 1995). In putting forward a storyline of sustainability, pro-dam actors not only highlight the links between a respective project and policy goals related to sustainable energy transitions and sustainable development but also exclude other grievances and demands (related to impacts or costs and benefits, for example) to present the respective projects as the result of technical, rather than political, decisions. In advancing these depoliticising storylines, pro-dam actors conceal alternative interpretations and visions of a project’s sustainability, as well as the interests and identities that underpin pro-dam assertions of its sustainability credentials (Swyngedouw, 2010, 2011, 2015a; Kenis and Lievens, 2014; Raco, 2014). Following the work of Chantal Mouffe (1993, 2000, 2005), I understand this concealing of alternatives as representing the denial of political conflicts, social demands and ideological contests about what society should be. As Mouffe (2013, p. 3) argues, “political questions are not merely technical issues to be solved by experts. Proper political questions always involve decisions that require making a choice between conflicting alternatives.” Within this reading, the planning and construction of a hydroelectric project do not merely represent a technical decision regarding GHG-mitigation and sustainable development. It represents the collision of the vision of what sustainability is and how large hydroelectric dams fit into such visions. It is this character of the political that depoliticisation limits, denying the legitimacy of alternative positions and storylines and the political character of dam projects, raising it above the terrain of the political and delegitimising resistance actors (Chhotray, 2007; Huber and Joshi, 2015). A language of sustainability becomes a route of anti-politics, in which dissenting views and divergent definitions of what should be sustained are excluded.

Depoliticisation is not just a discursive process. Now that its role in sustainable energy transitions is widely subscribed to, dam construction is gathering pace across the globe. In response, anti-dam movements against such projects across the globe are increasing in frequency also – from the resistance to the Tokwe-Mukorsi dam in Zimbabwe to the continued opposition to hydroelectric projects to the Condor Cliff (formerly the Néstor Kirchner) dam in Argentina. Recent research has found evidence of 220 dam-related conflicts across the globe (del Bene, Scheidel and Temper, 2018). These conflicts can often be violent – with opponents of hydropower projects criminalised, ostracised and, at times, threatened, assaulted and murdered. From the 2016 murder of Berta Cáceres, who was resisting the Agua Zarco dam in Honduras, to Margarito J. Cabal, murdered in 2012 while opposing the Pulangi V project in the Philippines, anti-dam activists have faced extensive violence. These processes of criminalisation, demonisation and violence function to depoliticise projects further by both intimidating those opposing projects and by presenting their grievances as unworthy of discussion. The presence of such violence highlights how the planning and construction of hydroelectric projects across the globe risk repeating the violence, marginalisation and human rights abuses associated with other extractivist activities – leading Del Bene et al. (2018) to adopt the term ‘renewables extractivism’ to describe the use of repression as a tool to delegitimise alternative definitions of sustainability.

The paradigmatic character of policies and rhetoric of sustainable development is evident in its wide application across and beyond contemporary environmental policy to describe supply chains, consumer goods and industrial practices. Yet, as different actors link principles of sustainable development to additional policy realms (such as supply chains or infrastructure), the original asserted compatibility between environmental protection and economic growth has become emptied of its initial attachment to principles of environmentalism (Brown, 2016). The term sustainability remains contested, malleable and open to other actors providing alternative definitions to challenge dominant understandings. There are diverse understandings of ‘sustainability’, including environmental justice, climate justice, and the ‘environmentalism of the poor’, that contest dominant assertions of sustainability as rooted in the reduction of GHG emissions (Martinez-Alier et al., 2016). Local communities often hold different definitions of the sustainability of a particular project or policy to those who devised, planned or built it. Following Cavanagh and Benjaminsen (2017), I understand these as ‘alternative sustainabilities’ that resist the dominant apolitical and technical conceptualisation of sustainable development, reasserting its political character and providing an alternative vision of environmental politics and climate change (del Bene, Scheidel and Temper, 2018).

Environmental challenges, and their solutions, are perceived in different ways. For example, the material consequences of building a dam (rising water levels, population movement) are presented in the storylines put forward by competing groups. The population displacement caused by a dam will be articulated differently by those for and those against the respective project. While opponents may present this experience as damaging and rupturing society, a proponent of a project may argue that those being displaced are well-compensated and are moving to safer, modern dwellings. Anti-dam storylines challenge pro-dam storylines of sustainability by illuminating grievances, demands and impacts – and asserting alternatives. In doing so, they illuminate the incompatibility of large-scale hydroelectric dam projects (and their social and environmental impacts) and the wider goals of sustainable development policies and plans for climate change mitigation. The storylines put forward by anti-dam actors interact with and challenge dominant assumptions of a dam project’s sustainability credentials and legitimacy. From movements that called for the end of World Bank funding for hydropower in the 1990s to those fighting for ‘energy sovereignty’ across the globe, anti-dam movements put forward alternative visions of not only particular dam projects but also their definition as sustainable pursuits.

In this book, I explore how anti-dam actors in Brazil have not only contested the planning and construction of the Belo Monte and São Luiz do Tapajós dams but have also put forward an alternative vision that reconfigures the pro-dam storyline of sustainability. In subsequent chapters, I detail how anti-dam actors in Brazil, drawn from a wider coalition, illuminate overlooked impacts (labelled as ‘rendering visible’), highlight the political interests, impunity and motivations behind construction (‘repoliticisation’) and foreground their resistance within the wider context of demands and grievances in contemporary Brazil (‘scaling up’). Taken together, advancing these storylines simultaneously challenges and reconfigures the pro-dam storyline of sustainability by exposing its narrow focus on GHGs and highlighting the social and ecological impacts of hydropower in the 21st century. Although the provision of storylines can be found in the words and actions of both pro-dam and resistance actors, the dominant trend in scholarship has been to focus on the pro-dam storylines that legitimise the construction of dam projects. In exploring the ways in which anti-dam actors contest and reconfigure pro-dam storylines, this text shines a light on how pro-dam storylines remain contestable and contested.

While scholarship has explored how anti-dam actors contest the planning and construction of dams by forwarding storylines that illuminate the social and environmental impacts of respective projects (Ahlers et al., 2015; Huber & Joshi, 2015; Warner et al., 2017), it is important to also explore how these resistance storylines simultaneously challenge and reconfigure dominant pro-dam narratives. Groups and individuals opposed to a dam project put forward their own storylines of resistance to not only critique the dam project itself (illuminating impacts, etc.) but to also challenge the pro-dam storylines of legitimacy. I argue that it is important for contemporary research to explore this process of interplay and contestation

further – analysing the numerous ways in which resistance actors contest dominant pro-dam storylines. In light of Sustainable Development Goal 7, which calls for ‘access to affordable, reliable, sustainable and modern energy for all’, this book explores how the ‘greener’ technologies included within this call continue to be contested, with their sustainability credentials subject to both disagreement and opposition. In doing so, the conclusions provided for greater attention to the contested sustainability of contemporary green technologies, policies and projects.

Research Strategy

Anti-dam movements are not homogenous. Their members do not necessarily share backgrounds, ways of seeing the world or definitions of sustainability. Instead, they represent broad, multi-scalar coalitions of different actors with a shared goal: the cancellation of the hydropower project that they oppose. The subsequent analysis focuses its attention on the ways in which members of the resistance coalition for national and international non-governmental organisations (NGOs), environmental organisations (EOs) and journalists interact with, critique and reconfigure the pro-dam storyline of sustainability. These organisations are important to anti-dam movements, collaborating with local networks of opposition to present their resistance to a wider audience, link it to broader concerns and change the terms of debate (Keck & Sikkink, 1998; Hochstetler & Keck, 2007)). This research focused on this segment opposition to gauge the ways in which they understand *sustainability*, how they locate hydropower within such a definition, and the arguments that make against hydroelectric dams in the 21st century.

This book draws on 37 interviews conducted (both in person and virtually) between 2016 and 2019 with actors in the resistance coalition. These actors are drawn from local, national and international organisations, as well as academics and journalists who have discussed and critiqued the Belo Monte and São Luiz do Tapajós dams projects. In addition, interviews were also conducted with high-profile representatives of the Brazilian environment agency, Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Brazilian Institute of the Environment and Renewable Natural Resources, IBAMA), Fundação Nacional do Índio (the National Indian Foundation, FUNAI), the government Ministério de Minas e Energia (Ministry of Mines and Energy, MME) and the Ministério Público Federal (Federal Public Ministry, MPF). These government organisations represent key actors in the planning, construction and operation of dams in Brazil. Furthermore, an interview was conducted with a construction manager of Norte Energia in December 2016. Interviewees and respondents were identified through internet searches, the detection of key actors within collected resistance sources (i.e. websites, press releases) and snowballing. Interviews were conducted, both in person and over Skype, in the cities of Rio de Janeiro, São Paulo, Brasília, Santarém, Belém and Manaus. Interviews were designed to encourage personal reflections on a number of key events in the construction of the Belo Monte and São Luiz do Tapajós projects (such as the 2016 cancellation of the latter) and to respond to a number of arguments provided by the dams’ proponents seeking to legitimise the schemes (such as those related to sustainability).ⁱⁱⁱ

Data taken from interviews has been supplemented by the collection and analysis of over 400 primary documents. These documents have been taken from numerous sources disseminated by various organisations and groups. Primary sources were selected through targeted online searches, using a series of key search terms. The sources discussed include documents created by government bodies, international civil society groups, domestic arms of international non-governmental organisations, national civil society, and local campaigning groups. I understand these primary materials as ‘communicative devices’, which are written and distributed to a specific, targeted audience for a particular purpose (Flick, 2009). They represent a partial and specific account of the projects researched. For example, a published report by WWF Brasil will be likely to report on the environmental impacts of the project, due to the organisation’s focus on environmental protection, while a news article by Movimento dos Atingidos por Barragens (Movement of Dam-Affected People, MAB) would, instead, focus on the social impacts. This contrast does not represent a denial of certain impacts but, instead,

represents the parameters of the respective respondent's views, definition of sustainability and understanding of the Belo Monte and São Luiz do Tapajós projects.

I have clear ethical responsibilities to the participants in this work. This was particularly the case working with environmental organisations in Brazil, who have faced a number of increasing threats in recent years, as detailed in subsequent chapters. With accusations of corporate espionage against environmental organisations and the deaths of environmental and human rights activists often discussed in interviews, I need to ensure that I have fulfilled my ethical responsibilities. Although many research participants indicated that they would consent to be named in this research, I made the decision to anonymise everyone who appears in this work. Whilst some are identified via their affiliation with particular organisations, others, at their request, are not.

Chapter Outline

This book is organised into eight chapters. Setting the next chapter aside, the subsequent chapters explore the ways in which anti-dam actors contest, critique and reconfigure the pro-dam storyline of sustainability put forward to legitimise the Belo Monte and São Luiz do Tapajós Dam projects in the Brazilian Amazon.

In Chapter 2, I outline the importance of analysing how hydropower projects become inscribed with wider significance due to their linkages and entanglements with wider political discussions, projects, problems and solutions. I assert the central role of storylines within this before introducing the *storyline of sustainability*. In doing so, I argue that pro-dam actors demonstrate an adaptive capacity, co-opting new demands and grievances into their legitimising storylines. However, this storyline remains contestable and, as I argue, research needs to explore the ways in which anti-dam actors contest and reconfigure pro-dam storylines.

In Chapter 3, I contextualise the Belo Monte and São Luiz do Tapajós projects. I explore the importance of hydropower in contemporary Brazilian politics, foregrounding the planning and construction of these two projects within a wider history of energy insecurity, developmentalism and core-periphery relations. Furthermore, I highlight how dam-building policies in Brazil remain open to contestation, with resistance networks providing powerful acts of dissent against the projects studied. I also profile the pro- and anti-dam actors involved in the contests surrounding hydropower in Brazil.

The text now turns to the empirical analysis of the materials collected. In Chapter 4, I focus on how national and international anti-dam actors work to regroup the Belo Monte and São Luiz do Tapajós projects within a political context that serves to illuminate how both projects were constituent parts of policy agendas with particular motivations and goals. While pro-dam actors asserted the dual role of this infrastructure project as contributing to Brazilian climate change mitigation goals, anti-dam actors argued that the projects represented a wider process of exclusion from decision-making. This represents a process of *repoliticisation*, with anti-dam actors detailing how political interests, corruption and impunity forced the project ahead, regardless of its impacts. In doing so, resistance actors highlight the political interests behind the construction of Belo Monte and São Luiz do Tapajós to illuminate how a language of sustainability has been captured and harnessed by political actors with what are deemed limited environmentalist credentials.

In Chapter 5, I turn my attention to how, in response to the dissemination of official environmental impact assessments (EIAs) for the Belo Monte and São Luiz do Tapajós dams, opposition actors have engaged in the provision and dissemination of alternative assessments of the social and environmental impacts associated with these projects. Within the storylines analysed, anti-dam actors emphasised the links of the projects studied to a number of impacts, including socio-economic impacts on the local area and indirect, cumulative impacts. While official EIAs (and the storyline of sustainability) adopted a narrow understanding of the projects' impacts, rendering them 'technical' and excluding the grievances and demands of others, anti-dam actors illuminate such impacts. I understand this as a process of *rendering*

visible – with anti-dam actors shining a light on the forgotten, overlooked and unmitigated consequences of hydropower in the Brazilian Amazon.

In Chapter 6, I explore the multifaceted and central role of indigenous communities in the opposition to the Belo Monte and São Luiz do Tapajós dams. This chapter explores the process through which civil society actors disseminated materials across the globe to assert the different ways in which the projects would (both directly and indirectly) impact indigenous communities living in the respective regions. Indigenous groups – in particular, the Kayapó and Munduruku communities – have been key actors in anti-dam action against the projects studied and the images of these actors dominated anti-dam materials disseminated across the globe. As a result, these communities – and their relationship with the projects studied – provided a focal point for the resistance against hydropower projects in the Brazilian Amazon. In opposition materials, national and international civil society actors highlighted how the projects studied represented a direct threat to the cultural identity and human rights of the traditional communities impacted. It is by illuminating these links that anti-dam actors assert the ties between the projects studied and a wider context of violence against indigenous groups, anti-indigenous rhetoric, and the systemic neglect of traditional communities in contemporary Brazil. As a result, the opposition to the Belo Monte and São Luiz do Tapajós projects is *scaled up* and they are characterised as single sites in a far wider struggle.

In Chapter 7, I turn to the 2016 decision to ‘archive’ the São Luiz do Tapajós project, removing it from the environmental licensing process. The chapter comes in two parts. First, I will profile the reasons – official and otherwise – behind the 2016 removal of the São Luiz do Tapajós project from national energy plans, detailing their context and validity. The official reasoning for this decision is the uncertainty – asserted by the Brazilian environmental regulator (the head of which was interviewed within this research) – regarding the social and environmental impacts of the project. Despite this, anti-dam actors discussing the decision highlight a number of additional reasons – including the exposure of corruption, a prolonged economic recession and the 2016 impeachment of President Dilma Rousseff. Second, I will turn to how, although the suspension of the São Luiz do Tapajós Dam project could be considered to represent a victory for the resistance coalition, opposition actors quickly looked to the future. In this chapter, I explore the reasoning for this. For many, the projects studied were intricately linked to an emergent political antagonism, related to the growing tension between environmental protection and the expansion of agribusiness into the Legal Amazon Region. This is with particular reference to the policies of the government of President Michel Temer (2016–2019) and the *ruralista* political faction. As a result, civil society actors presented the São Luiz do Tapajós project as only one stage in a wider contest between resistance actors and political interests threatening environmental protection and the rights of indigenous communities. As I discuss in this chapter, such assertions became prophetic, as is evident in the 2018 election of Jair Bolsonaro as president. In making this argument, resistance actors assert that the contest over hydropower is far from over, with the construction of hydroelectric dams in the Brazilian Amazon a constituent part of a wider threat of extractivism in the region. Resistance actors look to the future and argue that the São Luiz do Tapajós project represents just one site in the continued antagonism between, on the one side, Brazil’s indigenous communities and contemporary environmentalism, and, on the other, successive governments’ economic policies.

In this concluding chapter, I explore the arguments and related implications developed throughout the previous chapters and reflect on how the resistance coalition, opposed to the Belo Monte and São Luiz do Tapajós Dam projects, advanced storylines that reconfigure the dominant storylines of sustainability adopted by the pro-dam coalition. I detail the transformative potential of the new storylines of sustainability detected and look to the future, [tracing the trajectories of an emergent ‘just sustainability’ discussing routes for future research](#). Finally, I reflect on political events in Brazil since 2018, reflecting on the environmental policies of President Jair Bolsonaro, looking to the future and discussing the continued presence of – and need for – environmental resistance in the Brazilian Amazon.

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ⁱ Defined as the nine federal states that overlap with the Amazon river basin (Acre, Amapá, Amazonas, Pará, Rondônia, Roraima and Tocantins and parts of Mato Grosso and Maranhão).

ⁱⁱ Under the 2011 Marrakech Accords, a project's eligibility for CDM funding is approved by the host country, with the government issuing a Letter of Approval certifying the sustainable development credentials of the project. In Brazil, this decision is made based on the submission of an additional document, detailing the project's integration into local and regional sustainable development policies (Fernández et al., 2014).

ⁱⁱⁱ A number of interviews were translated by a third party and are not analysed for the discourse present within them. Rather than analyse these materials for the lexical choices made in them, I analyse how these materials frame the Belo Monte and São Luiz do Tapajós projects and how these materials provide data and case studies that challenge the pro-dam storyline of sustainability.