6. The hydroelectric power plant Belo Monte and its environmental and socio-ecological impacts

6.1. The struggle of operators and opponents of the construction of Belo Monte, the confusion of judgements and political entanglements

Already at the end of the 1960s, a project study by the American Hudson Institute had shown a scenario of huge reservoirs for energy production in Amazonia. Two decades later, after vigorous Brazilian protests against this foreign interference, the reservoir ideas appeared in a modified form in the national energy plan.

Since the possibilities of using hydropower have been exhausted in large parts of the country, Amazonia became the new target area of the energy programme Plano 2010 at the end of the 1980s. Due to the ecological and social problems of large reservoirs already built during the 1980s on the Rio Tocantins (Tucuruí) and Rio Uatumã (Balbina), there were violent protests against the construction of reservoir chains on the tributaries of the Amazon and the plan was abandoned (Kohlhepp 1998c; 2010c).[268] The low natural gradient in Amazonia leads to extensive reservoirs during the construction of hydroelectric power plants, which flood large areas of rainforest and thus destroy parts of the habitat of the riverine and the Indigenous populations.

Lack of resettlement management, low and delayed compensation payments, and unwillingness to resolve conflicts of interest characterise all power plant constructions with large reservoirs since Itaipu and Sobradinho. In the case of the earlier large-scale projects, there was no detailed environmental impact assessment, the scientific know-how to assess the ecological consequences was lacking and project development during the military dictatorship lacked any sensitivity to the socio-economic consequences, which manifested itself in a complete underestimation of the social needs and the related costs.

Brazil's democratic opening with the new environmental legislation and regulations on environmental impact assessment (EIA) had initially led to a turn away from excessive planning of ambitious "mammoth projects." This decision stood until 20 years ago, despite excessive lobbying by the construction companies and the hydroelectric power plants.

The strong overall industrial development, the implementation of large aluminium smelters in East Amazonia, the agricultural boom in Central Brazil as well as the ex-

268 See chapters I.4.3 and I.5 in this volume.

pansion of urban centres have led in the first decade of the 21st century to the resumption of power plants and reservoir plans in a modified form. This was favoured by the international climate debate and hydropower as so-called "clean" or "green" energy. The reservoirs with flooded biomass and their enormous release of CO_2 and methane have often been forgotten in the life cycle assessment of hydropower.

The construction of the large power plant Tucuruì (8400 MW) was carried out within the framework of the regional development programme Grande Carajas (PGC),[269] in particular for the subsidised energy supply of the regional alumina and aluminium industries. A particular example of the absurdity of some projects was the Balbina power plant, which was built to supply the regional metropolis of Manaus. However, due to the natural conditions and the large environmental degradation caused by the 2360 km² reservoir, the energy production is barely sufficient to supply an urban quarter. Due to the serious environmental and social consequences of such projects, the World Bank denied Brazil the second energy sector loan.

The Altamira complex (Babaquara/Kararaô) on the Rio Xingu, which was rejected in its earlier form in 1989, was revitalised and came back on the agenda during the Lula da Silva government in 2003. It was renamed the new Belo Monte mega-project, even without prior consultation with the Indigenous people of the region. This project with a planned installed capacity of 11 000 MW was one of the largest hydroelectric power plants in the world. The government had offered little transparency to the people affected by the hydroelectric project, as has been unfortunately always the case in Brazil. Fierce protests occurred, especially by the Indigenous population[270] because of their endangered reservations and an area of 6150 km² planned to be flooded.

Between 1989 and 2002, the project had been redesigned. The reservoir's surface area was scaled down to 480 km² by moving the dam further upstream to reduce flooding of the Bacajá Indigenous area. The new environmental impact assessment contained the introduction of a run-of-river model, in contrast to the large reservoirs which were characteristic of previous projects.

In 2007, at the beginning of Lula da Silva's second term, the Growth Acceleration Programme (PAC) was introduced with enormous investments. The Belo Monte power plant complex figured as an anchor project of the new investment plans. In 2010, the environmental agency IBAMA granted a provisional environmental license for the construction of the dam despite critics from within the agency about pressure to approve the project and incomplete information in the EIA, presented by Eletrobras and participating construction enterprises. Independent Brazilian experts had issued a report on the EIA, identifying problems such as the project's uncertain cost, deforestation, uncertainties in generation capacity, high amount of greenhouse gas emissions and in particular the lack of consideration for those affected along the river's 100 km long southern "big bend" (Volta Grande). 140 Brazilian and international human rights organisations and environmental movements complained about the decision-making

269 See chapter I.4

270 Indigenous tribes of the region had organised the "First Encounter of the Indigenous Nations of the Xingu" in 1989. The encounter, symbolised by the provocation of the Indigenous woman leader Tuíra holding her machete against the face of the responsible manager, was leading to intensive disputes both in Brazil and internationally over the consequences of the planned six dams. As a result, five dams were removed from planning.

process in granting the environmental license for the project in a letter to President Lula da Silva in 2010.[271]

In April 2010, the Federal Attorney General suspended the project and cancelled the provisional environmental license as unconstitutional because of the lack of identifying the activities taking place in Indigenous territories, in particular in the Volta Grande region at the southern loop of the Xingu river. In August 2010, Lula da Silva signed the contract with Norte Energia S.A., in charge of and operating the Belo Monte hydroelectric power plant, a consortium mostly owned by the government, and funded primarily by the Brazilian Development Bank (BNDES). However, the construction was not permitted to begin on the Belo Monte dam complex until IBAMA granted the second of the federally required environmental licenses, the installation license. At least more than 20 conditions had not been met. FUNAI staff members expressed concerns about the location of the project, its impact on Indigenous territories, and the lack of attention to Indigenous people and opposed the operation license.

In 2011, however, the FUNAI management surprisingly stated that there was no reason to deny a limited construction license. The newly elected President Dilma Rousseff in 2011 strongly advocated rapid construction progress. As the Belo Monte licensing process neared full installation approval, international groups (Amazon Watch and International Rivers) made renewed appeals to President Dilma Rousseff: a petition signed by 500 000 people in February 2011 and a Brazilian petition with 1.3 million signatures (Fearnside 2017b).

The president of the environmental agency IBAMA resigned in dissent and because of political pressure to grant a license for the Belo Monte dam.[272] He was rapidly replaced and in June 2011 IBAMA granted the full license to construct the dam after – according to official information – additional studies had been carried out and costs paid to address relevant social and environmental problems. The only remaining license concerned the operation of the power plant.

Despite numerous lawsuits against Belo Monte construction and judgements to stop the project, construction works continued with partial permits. In February 2011, a federal judge had blocked the project citing environmental reasons. Construction received permission to resume work in November 2011, after another federal judge ruled that Indigenous people did not have to be consulted by law before work approval. In August 2012, work on the dam was stopped again by order of the Brazilian Federal Court, with the argument that the Indigenous peoples had not been consulted. The Supreme Federal Court overturned the decision of a lower court that had suspended the dam's operating license and ordered construction to recommence. The lower court suspension was due to allegations of human rights violations.

The Federal Public Ministry in Belém described the "valid operating license" for Belo Monte as "totally illegal." "The dam forced its way past multiple legal challenges by means of "security suspensions," a relic of Brazil's military dictatorship that allows

271 Compilation of information based on Brazilian and international press reports and statements from environmental organizations, e.g., *O Globo*, *Folha de São Paulo*, *O Estado de São Paulo*, *The Times*, *Financial Times*, *The Guardian*, BBC News, *FAZ*, *NZZ*, *Handelsblatt*, *The New York Times*, *The Washington Post*, Bloomberg Businessweek, Reuters; Greenpeace, International Rivers, Indigenous Peoples Issues and Resources, Rainforest Foundation, Amazon Watch, Mongabay, among others.

272 https://news.mongabay.com/2011/01/brazils-environment-chief-resigns-over-controversial-amazon-dam/ (accessed September 4, 2024).

projects to go forward despite any number of illegalities if they are needed to avoid "damage to the public economy" (Fearnside 2021a).

The showdown of the granting of the three-step environmental license and the repeatedly contradictory court decisions of different federal and regional court levels at short intervals led to uncertainty, disappointment, and anger as well as to ongoing protests of the affected population, in particular the Indigenous groups, but also of NGOs and environmental organisations. On the other side, the constant objections and accusations by environmental groups and the back and forth in licensing and the respective judgements annoyed the energy company Norte Energia as well as the timing, work organisation and financial management of the engineering and construction companies or consulting firms involved.

Belo Monte caused immense popular resistance and was highly questioned for lack of qualified environmental impact assessments prior to the start of the construction works. The project has been facing strong opposition from scientists, environmentalists, and local residents. Even an anti-Belo Monte film was produced. Celebrities publicly criticised the expected environmental impact of the Belo Monte power plant. Local people, including members of the local Indigenous tribes, several times occupied one of the dam's construction sites. The protestors demanded that the consortium responsible for the construction should ensure that the Indigenous lands be demarcated before starting work.

The politically very tense situation was characterised by the fact that President Dilma Rousseff in 2011 recalled the Brazilian ambassador to the Organization of American States (OAS), when the Inter-American Commission on Human Rights of the OAS officially requested that the licensing process for Belo Monte be suspended because the human rights of the traditional peoples to be affected had not been considered (Hall and Branford 2012).

Public hearings on the construction and on the environmental and social impacts of Belo Monte became particularly important due to the severe conflicts between the social actors involved and the number of participants. The public hearing, in the scope of environmental licensing, has been made compulsory in Brazil in 1986.

> It consists of an administrative procedure provoked by the public power through a licensing agency but paid by the entrepreneur and it aims at informing the population about the project which is under licensing. The public hearings are part of the licensing of those activities which may cause a significant environmental impact (Tagliani *et al.* 2020, 5).

As has long been criticised by many scientists, most environmental impact studies lack a focus on core issues and sometimes shift their focus to less relevant issues to divert attention from important points.[273] Transparency as to the criteria employed in assessing the significance of impacts is generally lacking. EIA and licensing procedures frequently are subject of political and economic pressure, interested in trouble-free progress of construction works.

Sometimes, NGOs successfully tried to exert pressure on the authorities with the threat of larger gatherings of people affected, even outside public hearings, in order to

273 Especially Fearnside (2007), among others.

achieve improvements for the local population. Informal knowledge of the local population and their perception of risk and cultural impact were often disregarded. The common practice of selecting comments only after decisions have been made has always been a cause of discontent and protests in society. The public hearings obviously did not adequately fulfil the role of promoting public participation, being an overly formal, bureaucratic, and inhibiting process. The recommendation for improving this situation could be a board of certified and independent environmental analysts and a closer cooperation with scientists and independent specialised entities. Environmental authorities must be provided with adequate material conditions and human resources to promote sustainable development through efficient inspection and monitoring capacities (Tagliani *et al*. 2020).

During the construction of the Belo Monte complex, it became apparent that the conflicts of interest between the operators and their supporters on the one hand and the opponents, i.e., the population affected by the construction work and its impacts and the supporting active environmental groups on the other, were almost insoluble.

The pro-dam actors were represented by the government agencies Eletrobrás and the National Agency for Electrical Energy (ANEEL), the powerful and influential construction companies that were specialised in dam construction, the aluminium and electro-intensive metallic silicon producing industries as well as the iron ore giant CVRD (Vale) and related industries. Additionally, groups of professionals, who were connected and dependent on the construction of Belo Monte, supported the dam construction, such as engineers, technicians, construction workers and other employees, consulting firms, professionals of different service providers, lawyers, security companies etc. as well as commercial interests from outside and from the near urban centre Altamira to supply the construction site and its work force. Local businessmen founded the Regional Forum for Economic and Socio-Environmental Development of the Transamazônica and Xingu. Politicians on the local and regional level supported all the activities of regional development and tried to use this for themselves and their municipalities. Even some federal judges could be counted as pro-dam key actors (Millikan and Hurwitz 2011; Fearnside 2017a, 18).

Indigenous groups were the most important opponents of dam construction, leading the anti-dam campaign. Indigenous Juruna and Arara people, as well as those of sixteen other ethnic groups were severely impacted by the construction works. They have maintained protests and demonstrations against Belo Monte during many years, occupied construction sites and government offices. Another group on the anti-dam side were the non-Indigenous riverside dwellers (*ribeirinhos*), living from fishing at the southern loop of the Xingu, now with reduced flow and in an area flooded by the Belo Monte main reservoir. Residents of Altamira, who were affected by the impacts of the construction work and the partial flooding of their residential area have also joined the protests.

An important organisation of the non-Indigenous opponents was the Movement for the Development of the Transamazon Highway and the Xingu, having contacts with a large group of social organisations. The catholic church in Altamira has been another important actor supporting the people threatened and endangered by Belo Monte. In particular, the bishop of the diocese of Xingu, Dom Erwin Kräutler, who had to live with bodyguards and a bulletproof vest due to threats, was one of the open eminent critics of the Belo Monte complex. President Lula da Silva had promised that

"Belo Monte will not be shoved down anyone's throat" (Hurwitz 2010, n. p.). However, Bishop Kräutler later stated that "none of Lula's promises have been kept."[274]

Brazilian environmental research organisations and NGOs contributed commendably to the detailed examination of the information provided by Norte Energia about the measures carried out for environmental protection. Their harsh criticism of the construction work and its ecological and social implications was supported by scientific expertise and mapping. These organisations include, among others: Instituto Socio Ambiental (ISA), Amigos da Terra Amazônia Brasileira, Comissão Pró-Índio de São Paulo, Comissão Pastoral da Terra (CPT) and the Movement of People Affected by Dams (Movimento dos Atingidos por Barragens, MAB). International support came from Cultural Survival, International Rivers and Amazon Watch.

Norte Energia has managed, in a very clever but now well-known way, to divide the Indigenous anti-dam groups by giving the chiefs very practical gifts such as motorboats, vehicles, petrol or food (Heurich 2013) in order to reduce or even to end their actions against the project. This led to many quarrels, envy and resentment within the tribes and their villages. This strategy was also successfully applied to some non-Indigenous groups who were subsequently swept into their activities and lost members who switched to the dam supporters. The awarding of smaller contracts for studies on environmental issues served to involve NGOs and was also intended to mitigate criticism. Some lawyers and consultants worked on both sides or changed sides.

After the disappointment of the Lula da Silva government's continued promotion of Belo Monte, overlapping interests with stress and disagreements arose in groups close to the president's Workers' Party (PT) (Scholz *et al*. 2003; Fearnside 2017a). The government gave funds for social and environmental projects to NGOs hoping they would refrain as much as possible from aggressive comments to Belo Monte. The same occurred with the Movement of People Affected by Dams. They dropped their opposition to Belo Monte when the PT won the election (Bratman 2014; 2015).

In Brazil's "lava jato" ("car wash") corruption scandal,[275] initially focused on the Petrobras corporation,[276] the state-owned flagship in the Brazilian oil business, chief executives admitted that bribes paid by large construction companies to the petroleum sector also applied to the electrical sector and the construction contracts for Belo Monte. Brazilian prosecutors uncovered a parallel scheme of massive fraud in the construction of mega-dam projects in Amazonia such as Belo Monte and Jirau on the Madeira river, involving a cartel of Brazil's largest construction companies, powerful

274 Interview by Bruno Calixto, Época Blog do Planeta, May 13, 2014, https://epoca.globo.com/colunas-e-blogs/blog-do-planeta/noticia/2014/05/bdom-erwin-krautlerb-do-que-lula-prometeu-nada-foi-cumprido.html (accessed September 4, 2024).

275 The "operation car wash" ("lava jato") was a criminal investigation by the Federal Police. Originally, it was a money laundering investigation, first uncovered at a car wash in Brasília, what led to this specific name. It began in 2014 and expanded to cover allegations of corruption at the Petrobras corporation, where executives accepted bribes in return for awarding contracts to construction firms at inflated prices. Investigations incriminated members of Petrobras, managers of large Brazilian construction companies, such as the Odebrecht Group, politicians from Brazil's largest parties, presidents of the Chamber of Deputies and the Federal Senate, state governors, and finally President Lula da Silva. The Federal Police considered it the largest corruption investigation in the country's history.

276 In March 2015, Brazil's Supreme Court disclosed an initial list of 54 top politicians approved for formal investigations in connection with Petrobras corruption.

politicians, and high-level government officials (Millikan and Poirier 2015; Watts 2019). CEOs of the who's who in the powerful construction business faced charges from federal prosecutors for "corruption, money laundering and participation in a criminal organization."[277]

In 2013, it was revealed that the four largest donors to election campaigns in Brazil in the first decade of the 21st century were construction companies building dams and power plants in Amazonia.[278] In Dilma Rousseff's 2010 election campaign, three of the four largest donors were also construction companies.[279] The leading political parties obtained financial support from construction enterprises "whether this is obtained as legal political donations, as illegal donations to secret slush funds ('caixa dois'), or as bribes to key politicians" (Fearnside 2017a, 17). The ruling Workers Party (PT)[280] and its former coalition partner, the Brazilian Democratic Movement Party (PMDB), were allegedly paid US$ 20 million each by the three construction companies.

Over 150 chief executives and leading politicians have been convicted in relation to the investigation since 2014, dozens were jailed, among them former Brazilian President Lula da Silva, the former president of congress, and former top ministers in Brazil's Workers' Party. Lula da Silva has always proclaimed his innocence and argued the case against him was politically motivated. He served 18 months of a 12-year term "for corruption and money-laundering" before being released from prison in November 2019. Due to his imprisonment, Lula da Silva could not run as a presidential candidate in 2018. The Supreme Court justice ordered that the charges against the ex-president were dropped, because of irregularities in the conduct of the proceedings by Judge Moro had put a strain on the process.

This scandal made it clear why Belo Monte was built despite all ecological, hydrological, social, financial, and economic counterarguments. The "lava jato" scandal exposed a culture of systemic graft, mutual dependencies and corruption in Brazilian politics and business life. All this led to serious damage to the reputation of the political and economic system of the country and to Brazil's international standing.

277 Fearnside (2017a, 17) according to *Folha de São Paulo*, February 6, 2016.

278 During the 2003–2010 presidency of Lula da Silva, executive posts in Petrobras were offered to his political allies. The criminal conspiracy ran after 2003, during a period when Dilma Rousseff, successor of Lula da Silva as President of the Republic in 2011, chaired the company's board of directors as Minister of Mines and Energy and later as chief of staff of the Lula da Silva administration. Though Dilma Rousseff was not directly implicated in the scandal, "lava jato" played a role in her impeachment in 2016.

279 *Folha de São Paulo*, 21 January 2013; Agência Brasil, 30 November 2010. The construction giant Odebrecht Group, in 2010 with 181 000 employees in 21 countries, was involved in the construction of many hydroelectric power plants and dams. The company was one of the biggest donors to politicians in Brazil and offered bribes in exchange for contracts in Brazil and in at least eleven other countries, mostly in Latin America. The Odebrecht Group made a leniency deal with US and Swiss authorities, in which it confessed to corruption and paid US$ 2.6 billion in fines for its criminal activities – the largest sum of its kind ever paid worldwide. About US$ 800 million returned to Brazilian state coffers (Summary of newspapers reports).

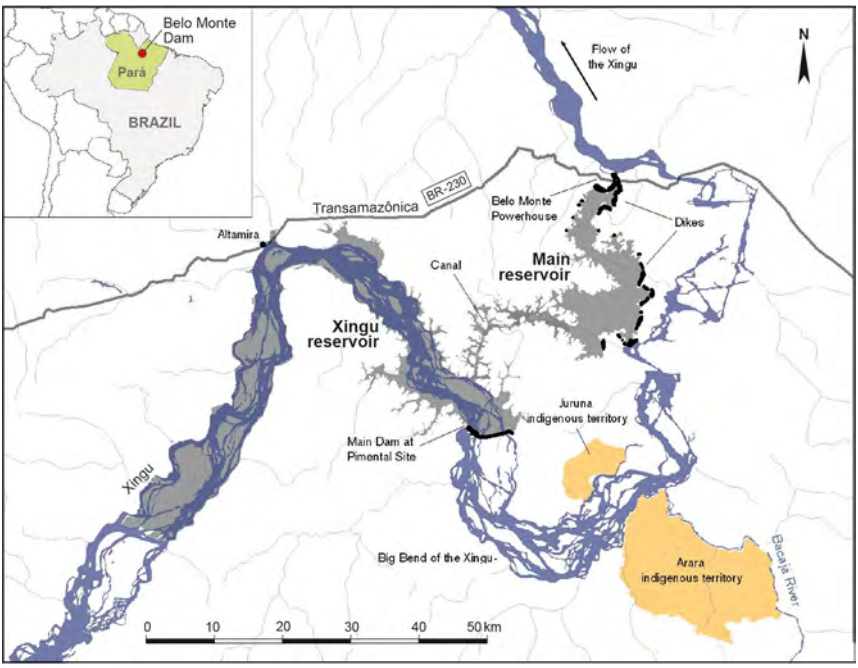
280 In March 2016, the former PT leader in the Senate confessed to federal prosecutors in exchange for leniency in the "lava jato" corruption probes that "the Belo Monte bribe served as a decisive contribution to the election campaign of 2010 and 2014" (Fearnside 2017a, 17).

6.2. The hydroelectric power plant Belo Monte and its environmental and social impacts

The Belo Monte hydroelectric dam complex on the Xingu river was completed in November 2019. The total installed capacity of the power plant is 11 233 MW, which makes it the second largest hydroelectric complex in Brazil behind the binational Brazilian-Paraguayan Itaipu dam (14 000 MW) and the fourth largest in the world by installed capacity. This, behind the Three Gorges dam (22 500 MW), the Itaipu dam and the Xiluodu dam (13 860 MW) in China.

The Belo Monte hydroelectric project comprises three components: the main dam (36 m high, 6.25 km long) on the Xingu river at Pimental site with a supplemental powerhouse (233 MW) and spillway, creating the Xingu river reservoir; the main powerhouse at Belo Monte (11 000 MW; Belo Monte dam 90 m, 3,5 km) and the Belo Monte reservoir (main reservoir: 478 km²) with the water retained by over a dozen large dikes. The Pimental dam diverts the Xingu river's natural flow into a constructed channel, then into a reservoir and towards the main electricity-producing Belo Monte powerhouse. The total project area is about 1500 km², direct forest clearing was 400 km². The new design diverted the water away from Indigenous territories (Fig. 36).

Figure 36. Belo Monte hydro-electric power plant and reservoirs in the Xingu region



Source: Own elaboration, based on International Rivers and Instituto SocioAmbiental (ISA).

Belo Monte is not a hydro-electric power plant with a storage dam like Tucuruí and others, but a run-of-river plant depending on the river's flow. Belo Monte was planned to operate at an average level of "firm energy" generating 4571 MW throughout the year

(Higgins 2020). Experts had already pointed out early that – according to precipitation conditions in Central Brazil – the extreme differences in the water flow of the Xingu would greatly affect the operational capacity. The former Minister of the Environment of the state of São Paulo argued that Belo Monte would be one of the least efficient hydro-power projects of Brazil, producing only 10 % of its 11 233 MW potential capacity between July and October (1123 MW; an average of only 4419 MW throughout the year, or a 39 % capacity factor) (Antunes 2010).

In 2019, during the dry season in Central Brazil from July to November the flow of the Xingu dropped to an extremely low electrical energy production level of less than 600 MW (Maximum in 2019: 6882 MW in February; Minimum: 276 MW in October) (Higgins 2020). Norte Energia was forced to shut down the turbines frequently to prevent damage. For three months, the Xingu river has not sufficient water "to turn even one of the 20 turbines in the dam's main 11 000 MW main powerhouse" (Fearnside 2017a, 15,16; 2017b, Fig. 1) leaving only the auxiliary powerhouse at Pimental site (233 MW) in operation.

As was well known, the Xingu river has one of the greatest annual variations in water flow of all Amazon tributaries, with high-water season flows up to 60 times those of the low water season (Fearnside 2006; 2017a, 15).[281] In 2010, the statement of Eletronorte – based on President Lula da Silva's resolution – was not convincing that the construction would be possible even without another additional dam and reservoir for river regulation (Kohlhepp 2010c).

It became clear that the new project, which had only been approved without additional dams and reservoirs at the Xingu river, due to the problem of flooding of Indigenous territories, in fact could not be economically viable. Critics claimed that the project only makes financial sense if the Brazilian government builds additional dam reservoirs upstream to guarantee a year-round flow of water. At Belo Monte, the "institutional lie" (Fearnside 2017b, 177) concerning plans for upstream dams was deliberately left out of the discussion in Brazil. According to all known hydrological data, the project should not have been approved due to lacking capacity for the planned energy production. The fear of many observers that the political pressure to build more dams upstream on the Xingu to guarantee a sufficient flow of water soon would increase, seems to be confirmed.

In October 2019, Norte Energia declared "water emergency," as the water level in one reservoir had dropped so much that an unreinforced dam's earthen base could be damaged (Watts 2019). However, the fundamental problem was obvious: Norte Energia needs a total of 1000 m^3/s in Xingu river flow to meet its government agreed requirements, supplying sufficient water to the reservoirs and powerhouses, and to the huge bend (Volta Grande) in the Xingu river bypassed by the Belo Monte project. There is a shoreline populated by *ribeirinhos* and Indigenous people who rely on the water for their fishery and livelihood. When the water flow dipped down to 750 m^3/sec., the company reduced the amount flowing through the channel to the main reservoir to 100 m^3/sec.

281 The historic average discharge of the Xingu river in the sector of the Belo Monte hydropower complex for the period from 2004 to 2014 was 1408 ± 513 m^3/s during the low-water season and 18 983 ± 9228 m^3/s in the high-water season, according to the National Water and Sanitation Agency (ANA) in 2017.

The remaining outflow to Volta Grande was extremely low and endangered not only the fishing but also the basic supply of the local residents. The "big bend" is a 100-km stretch of the Xingu river from which 80 % of the water flow has been diverted (Fig. 36). Fish that sustained the populations of the Arara and Juruna along this southern loop of the Xingu river and a third group located on the Bacajá tributary largely disappeared. The fish fauna of the Xingu river is extremely rich, with a high degree of endemism. According to experts, the extremely reduced flow through the "big bend" will not be capable of maintaining species diversity. Further problems loom on the horizon. A new mega-project called Volta Grande Project, led by a Canadian gold mining company, will be situated adjacent to the same stretch of the Xingu that is dewatered by the Belo Monte complex.[282]

Even the navigability of this river stretch is endangered. The Xingu and its tributaries have their sources in Mato Grosso and depend on forest cover for dependable water flow. Deforestation in the Xingu basin increased 81 % from 2018 to 2019. Dramatic increases in regional deforestation in Mato Grosso and southern Pará by soybean plantations and cattle ranches caused less precipitation and climate change reduces river flow, which will be dwindled by 20–30 % in the Xingu basin in the next 30 years.[283] This will getting worse in the future.

In November 2019, Norte Energia formally asked Brazil's National Electric Energy Agency for authorization to build thermoelectric plants alongside the Belo Monte dams, what would probably mean the use of fossil fuels. "The company denied it was trying to make up for the hydro project's electricity shortfalls" (Higgins 2020).

If allowed to build thermoelectric plants, Norte Energia could at least make more use of its two US$ 3.6 billion 800 kV ultra-high-voltage direct current transmission lines, owned by the Chinese State Grid corporation, which transmit electricity from the Xingu substation to Rio de Janeiro and Minas Gerais states and to the Belo Monte–Estreito line. These power lines are underused for five months of the year. The electric energy produced in Belo Monte is used first for the electro-intensive alumina, aluminium, iron, and other smelting industries in Pará and Maranhão, owned by global players such as Alcoa, Alcan, Norsk Hydro and Vale. The export of these products creates little employment in Brazil. A significant proportion of the energy goes to the powerful industrial sector in Southeast Brazil, mainly in São Paulo and Minas Gerais.

Norte Energia violated national and international laws by not sufficiently consulting Indigenous peoples impacted by Belo Monte. Broken promises in dam construction in the Amazon region since Balbina and Tucurui have a long tradition. The Indigenous protests attracted regional attention and international moral support but were ultimately unsuccessful as construction continued ruthlessly. Since the operator of the power plant continued to make untruthful claims, the Arara responded with a call for help to the international press:

282 The mining company was accused of acquiring public lands illegally and mining operations would be about 10 km from Indigenous lands. Impacts of impoundment and mining operations could dramatically alter the Xingu's biodiversity and ecosystem services that support Indigenous people and riverine populations. Tons of toxic waste would be stored in a high-risk tailings dam (Tófoli *et al.* 2017).

283 Data cited in Higgins (2020).

> Letter from the Arara People to the world: We, the Arara Indigenous People of the Iriri river, are tired of being deceived by Norte Energia. We want respect! Ever since the Belo Monte dam arrived, our situation has only worsened. Our territory has become the business counter of the world. Our forest is suffering a lot. With each passing day we hear more noise from chainsaws eating our territory. Our river is growing sadder and weaker every day. This is not normal. We are being attacked from all sides. We have never been in such need. We are very concerned about the future of our children and grandchildren. How long will Norte Energia continue to deceive us? Why hasn't the removal of invaders of our Cachoeira Seca Indigenous Land been carried out until today? We ask everyone to help us build a great campaign for the defense of our territory.[284]

The Indigenous communities suffered from the denial of their fundamental human rights, from loss of biodiversity, landscape degradation, air, noise, and water pollution of construction works, excessive migration pressure, violence, and destruction of living conditions (hunting, fishing). Indigenous tribes reported attacks and harassment, and even the death of Indigenous persons as a result from aggressive illegal activities in their territory.

While the Indigenous groups were sometimes very vocal and were also considered in the suggestions for improvement and partial indemnification during the construction phase, the riverine population (*ribeirinhos*) was initially hardly considered in their needs. They lived on the shores and islands in what is now the Belo Monte main reservoir and along the "big bend". About 18 000 to 20 000 people were affected by the Belo Monte procedures. The urban residents of Altamira who were displaced amounted to 25 000 (Fearnside 2017a, 20). The relocation and the compensation of more than 43 000 people proved to be extremely complicated and could not satisfy the needs of the people concerned, especially since the promises about the amount of compensation payments were not kept. Without the support of social movements, an articulation of those affected would not have been possible (Weißermel 2019). Unfortunately, this is in line with the tradition of unsatisfactory resettlement and precarious compensation payments for earlier large-scale power plant projects.[285]

At Belo Monte, the *ribeirinhos* suffered from involuntary displacement, loss of traditional practices and material losses. Logging activities, soil contamination, erosion problems and decreasing water quality additionally threatened their existence. The river diversion negatively affects fishing, the stability of the groundwater horizon, ability to transport on the river and stagnant water is a risk of water-borne diseases. Options for rural resettlement were located far away from the river so that most people preferred urban resettlement.

Incomprehension of the problems of those affected, unwillingness to give solid treatment of the specific rights of the settlers as well as the non-recognition of interdependent urban and rural life forms caused precarity (Weißermel 2020). The expul-

284 Letter from the Arara people, dated 17 November 2020, (signed by Timbektodem Arara, President of the Arara People's Association KOWIT, and Mobu Odo Arara, Chief), translated from Portuguese, cited by Fearnside (2021a). This letter is in response to a letter from Norte Energia to the New York Times, dated 10 October 2020, claiming "that Belo Monte has been guided by respect for the local Indigenous populations and by laws, ratified protocols and conventions." The New York Times declined to publish the Arara response.

285 As in the case of Itaipu, cf. Kohlhepp (1987d), Kohlhepp and Karp (1987).

sion of people who have lived for generations in traditional community structures with mutual support and whose skills, such as fishing, does not make them suitable for other contexts led to a heavy social impact. The disruption of an integrated co-existence with the Xingu river and its ecosystems, lacking social and economic exchange and the process of deterritorialisation affected the riverine people psychologically. At the beginning of the compensation negotiations, the *ribeirinhos* were not recognised as a traditional people by Norte Energia. However, the *ribeirinhos* have a constitutionally guaranteed right to their way of life. They have organised a resistance movement, demanded the creation of a "*ribeirinho* territory" and refused to continue as forced "urban poor" in precarious settlement conditions (Brum 2018) without an adequate infrastructure and a profoundly disrupted social structure.

The urban population of Altamira (1970: 4700; 1974: 13 000, estimates; 2022: 126 000) has grown significantly due to numerous migrants in the last decades.[286] 25 000 workers were temporarily occupied in the Belo Monte construction, only 2000 permanent jobs were retained – the majority of trained employees. Thus, after construction, many thousands of workers remained unemployed in Altamira, leading to increased social tensions and a chaotic situation in precarious neighbourhoods with high rates of crime, violence, drug trafficking and prostitution. In 2017, the Atlas of Violence[287] ranked Altamira as Brazil's most violent large city with an annual murder rate of 125 deaths per 100 000 people (Brum 2018).[288]

However, most urban businesspeople who had supplied the construction site with services and goods have benefited greatly and are still in a very good economic position despite a somewhat declining order situation.

The Brazilian Society for the Advancement of Science (SBPC)[289] authored a 400-page report on the dam's social impacts which claims that Norte Energia has de facto ended the *ribeirinhos*' way of life and means of subsistence. The unpublished report stated:

> With the forced displacement of the *ribeirinho* communities, they lost their territory, access to the natural environment and resources that they relied on for their livelihood and income, which means that they were robbed of the conditions that guaranteed their social and cultural reproduction […] When they were displaced, they began to buy practically all foodstuffs, living in a situation (of) food insecurity (Anderson 2017, n. p.).

286 At the beginning of the 1970s, Altamira played a key role in the construction of the central part of the Transamazônica (Altamira–Rurópolis–Itaituba). Due to numerous workers and migration, the small town was nearly overwhelmed in its urban functions and experienced a short boom in its commercial activities and as a stronghold for government authorities entrusted with the development programme for Amazonia. However, social tensions were rapidly increasing, the population, which had increased two-and-a-half times to 13 000 within three years, declined and trade stagnated. Cf. Kohlhepp (1976a; 1978c), based on field work in 1973 and 1975. Cf. details about Altamira in Vol. 1, part 2 by Jan Kleinpenning and Vol 1, part 3, chapter by Ron Milder.

287 Published in 2017 by the Institute for Applied Economic Research, a public thinktank.

288 The murder rate in Rio de Janeiro in 2017 was 22 per 100 000 people.

289 SBPC is a non-profit organization, focused on promoting scientific and technological advances and has been playing a key role in expanding and enhancing Brazil's science and technology system, in addition to making science public and more popular.

The excessive costs of the construction of Belo Monte are estimated at around US$ 16 billion upwards, and the transmission lines US$ 3.5 billion. 80 % of the financing came from the Brazilian National Bank for Economic and Social Development (BNDES), including substantial amounts of funding from Brazilian pension funds and tax revenues (Bratman 2014).

It is also revealing that some of Brazil's big construction companies, including Odebrecht and Camargo Corrêa, never invested their money in the Norte Energia consortium at Belo Monte and remained protected from the speculative risk the electric company posed. As a result, only public sector entity investments – from Brazilian pension funds and the state-owned Eletrobras energy company – vouched for Norte Energia (Higgins 2020). As for the consequences of the impact of the mega-project on the environment, the Brazilian government countered the criticism by assuring a spending of US$ 800 million by the consortium to protect the environment.

The fundamental problem of lacking environmental justice in Brazil's Amazonian dam building has not changed. Hydroelectric projects in Amazônia Legal have shown a consistent pattern of human rights violations, actions without consideration of social and environmental concerns in general. Political pressure on individual technical staff members in the licensing department of IBAMA to approve high-priority hydroelectric projects had been common. Amazonia and its people are paying the environmental price for the national corruption in licensing procedures and for the economic progress of countries importing products from Amazonia, countries that would themselves no longer accept the impacts of the kind unleashed by these power plants (Fearnside 2019).

6.3. Political decisions of the Rousseff and Temer governments concerning Amazonia during the decade of the construction of Belo Monte

After President Lula da Silva gave the go-ahead for the Belo Monte power plant complex in 2010, this plan was fully adopted under his successor Dilma Rousseff (PT: 2011–2016). other major infrastructure projects under the Growth Acceleration Programme (PAC-II) were continued or started. During the 2010 presidential campaign her advertising feature was "mother of the PAC" (Fearnside 2017a, 18). She favoured dams with big reservoirs and vetoed all funding for "non-hydraulic renewable energy" in Brazil's Pluriannual Plan (2016–2019).[290] As mentioned earlier, renewed appeals to President Dilma Rousseff with several petitions by international environmental organisations with more than one million signatures to stop the licensing process of Belo Monte remained unheard. As could also be observed later, Rousseff had poor communication with the environmental movements and NGOs.

In addition to the construction of Belo Monte, which filled the headlines, other large hydroelectric power plants, which had already been approved at the end of Lula da Silva's term, were built and came into operation during the presidency of Dilma Rousseff. This mainly concerns the large power plants Jirau and Santo Antônio in Rondônia on the Madeira river, a large tributary of the Amazon river. As in Belo Monte,

290 *Notícias Socioambientais*, January 27, 2016 (ISA).

decision-making and environmental licensing measures were taken against the objections of the technical staff of IBAMA. The decision to build the dams was made before the impacts were thoroughly evaluated and the licensing continued under political pressure (Fearnside 2015b; Souza 2023).[291]

The huge projects based on transnational South American infrastructure integration programmes for power generation were not geared towards the socio-economic, ecological and ethical sustainability of the riverside population. The dynamics of the globalisation of space collide with the way of life of these local traditional communities. Due to the impact of the construction and operation of hydroelectric power plants, the traditional riverside communities living on the banks of the Madeira river were exposed to the effects of globalisation with deterritorialisation, fragmentation of their territory and loss of collective identity. Most of these people suffered from inexistent environmental justice, had to leave their territories, migrated to rural or urban marginalised areas and were plagued by poverty (Souza 2023).[292]

Jirau (installed capacity 3750 MW) and downstream Santo Antônio (3580 MW) are among the largest power plants in Brazil. Both dams are run-of-river projects without large reservoirs (110 and 138 km²). They are part of a planned four power plant Madeira river hydroelectric complex, which will consist of the two dams in Brazil, a third on the border of Brazil and Bolivia, and a fourth power station inside Bolivia, still in planning. The Madeira river carries very high sediment loads which originate primarily in the Beni sub-catchment region in Bolivia, making sediment data monitoring difficult.

Dam builders at Jirau, the French multinational GDF Suez and Brazilian construction company Camargo Corrêa, failed to adequately consult with Indigenous peoples, as required by law. Despite the environmental re-mediation efforts highlighted by the operators, the construction caused destructive impacts on the rich inland fishery – blockage of fish migration, among others – and conflicts with thousands of displaced fishing people. At both power plants, protests occurred against increasing violence of workers during the construction period. The relocation of the dam at Santo Antônio led to the flooding of lands of resettled population due to the increased level of the reservoir. In addition, there were road closures and temporary power plant occupation due to unfulfilled promises to displaced residents of the use of residential buildings in Nova Mutum built during the construction works.[293] On the other hand, there were riots and strikes by workers against working conditions.

The generated electrical energy of the two Rondonian power plants goes mainly to the Araraquara substation in the state of São Paulo by transmission lines about a distance of 2375 km.

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291 Cf. chapter II.5.1.

292 The outspoken leader of one of the fishing cooperatives was murdered in 2016. She was known in the region as Nicinha, denouncing human rights violations committed by the consortium responsible for the Jirau power plant. Her complaints generated two civil investigations being conducted by the Federal Prosecutor's and the State Prosecutor's Office. The assassin escaped from prison in Porto Velho.

293 In 2016, the Movement of People Affected by Dams (MAB) organised a film documentary with numerous interviews of affected people: "Jirau e Santo Antônio: relatos de uma guerra amazônica" ("reports of an Amazon war") (https://www.youtube.com/watch?v=ZFQ11fri3vs, accessed November 26, 2022).

In 2013, the Jirau hydroelectric power plant earned the plant registration under the Clean Development Mechanism (CDM) programme of the United Nations. Jirau is the largest renewable energy plant project to date in terms of tons of carbon dioxide equivalent (CO_2-e) potentially mitigated.[294] The CDM is awarded to innovative projects that help to solve environmental problems such as climate change.

An important feature of the Kyoto Protocol is the CDM

> providing a means by which projects in developing countries can be funded through the sale of carbon credits to developed countries (Annex I countries); thus, allowing the developed countries to meet their Kyoto Protocol emission quotas (assigned amounts) more economically, while at the same time helping the developing countries (non-Annex I countries) to achieve 'sustainable development' (Fearnside 2013b, 682 f.).

For example, the CDM allowed carbon credits to be sold to the European Union Emissions Trading Scheme. Projects for hydroelectric power plants are among the most controversial parts of the CDM, especially in tropical areas such as the Brazilian Amazonia.

The assumption that hydroelectricity is clean energy has been contested, especially for Amazonian dams. In general, Fearnside (2013b, 683) clearly pointed to the doubtful use of emission allowances granted and analysed the rationale for the current CDM rules for granting carbon credit to hydroelectric dams. The Kyoto Protocol[295] required that all CDM projects must contribute to sustainable development. This requirement has been effectively neutralised by the decision that each country decides for itself what sustainable development is, and any project submitted to the CDM by the host country's national authority is automatically assumed to represent sustainable development. This means that three basic criteria must be met: social, environmental, and economic. It is quite obvious that in most cases these criteria are not sufficiently fulfilled. The main problems include underestimation of greenhouse gases (GHG) emis-

294 "Brazil's Jirau hydro project world's largest CDM-registered renewable plant" in *Hydro World*, 6 May 2013.

295 The Kyoto Protocol was adopted in 1997 and entered into force in 2005. It is an international treaty which extended the 1992 United Nations Framework Convention on Climate Change in Rio de Janeiro by committing industrialised countries and economies in transition to limit and reduce greenhouse gases (GHG) emissions in accordance with agreed individual targets. The Protocol based on the scientific consensus that global warming is occurring and that human-made CO_2 emissions are driving it. The Kyoto Protocol only referred to developed countries because it recognised that they are largely responsible for the current high levels of GHG emissions in the atmosphere. The Kyoto Protocol sets binding emission reduction targets for 37 industrialised countries and economies in transition and the European Union. Overall, these targets add up to an average 5 % emission reduction compared to 1990 levels over the five-year period 2008–2012. In the Doha Amendment 2012, the Kyoto Protocol was adopted for a second commitment period, lasting until 2020. One important element of the Kyoto Protocol was the establishment of flexible market mechanisms, which are based on the trade of emissions permits. Under the Protocol, countries must meet their targets primarily through national measures. However, the Protocol also offers them an additional means to meet their targets by way of three market-based mechanisms: International Emissions Trading, Clean Development Mechanism (CDM) and Joint implementation (JI). The Protocol also established a rigorous monitoring and verification system, as well as a compliance system to ensure transparency and hold participating countries (Parties) to account.Cf. https://unfccc.int/kyoto_protocol (accessed November 29, 2022).

sions by the reservoir and the construction of the power plant itself, emissions from deforestation induced by the dam construction, and many noncarbon environmental and especially social impacts.

6.3.1. New mega-projects in the Carajás region and Chinese investment in Amazônia Legal

Apart from the construction of large new hydropower plants, attempts were also made in the 2010s to revive Marabá as an industrial location[296] which was severely weakened by the closure of steel plants during the economic crisis in 2008/09. More recently, there have been new project plans.

Brazilian mining giant Vale S.A.[297] and local steel manufacturer Siderúrgica Norte Brasil (Sinobras) signed an agreement to create a new steel unit. The plant will be based in Marabá and focus on the production of steel billets from pig iron. Sinobras was one of the only companies in the industrial district of Marabá that did not stop operations in 2008. Sinobras is the largest operating steel industry in Amazonia and is part of the Belo Monte Hydroelectric Plant consortium. Its current estimated production is 380 000 t of rolled steel per year. It has a staff of 1700 employees. The plant's production is aimed at the domestic market, mainly civil construction.[298]

Vale has started construction of a new US$ 340 million plant to produce "green" pig iron in Marabá. Pig iron is used in steel production. The plant will be built by Vale subsidiary Tecnored, which is focused on developing a low-carbon pig iron process by substituting metallurgical coal with biomass as an energy source. The unit will have an initial capacity to produce 250 000 tpy of "green" pig iron. The start-up is scheduled for 2025.[299]

The big problem remains the supply of biomass, i.e., charcoal. Sinobras has a reforestation project with 16 own *Eucalyptus* plantations in an area of 35 500 ha. However, the company is facing strong criticism and is described as "one of the largest deforesters in the Amazon."[300]

As envisaged since the beginning of iron ore mining at Serra Norte in Carajás, Vale began work on iron ore mining at Serra Sul, some 60 km to the southwest, in the last decade. This project, the largest in Vale's history to date, is the largest such project in the world. The project, called S11D (S: Serra Sul; S11: ore body; block D), has a mining potential of 10 billion t of iron ore, block D on its own contains 2.8 billion t of high

296 See chapter I.4.2.5.

297 Formerly Cia. Vale do Rio Doce, privatised in 1997 and renamed in Vale S.A. in 2007. Today, Vale has 55 000 employees and invoices of more than US$ 36 billion/year.

298 https://vale.com, April 15, 2022; https://mining.com, June 4, 2022; https://www.bnamericas.com, June 4, 2022 (accessed August, 28, 2023).

299 https://steelorbis.com, April 13, 2023 (accessed August 28, 2023). State-controlled China Communications Construction Co (CCCC) and Vale have agreed to set up a steel mill with a US$ 450 million investment (https://www.reuters.com/article/markets/currencies/brazils-vale-chinas-cccc-to-co-invest-in-steel-plant-idUSKCN1ST1OR/; accessed September 4, 2024).

300 Steel mills are among the "largest deforesters" because they use wood for charcoal production. For these industries, it is cheaper to buy wood from rain forest areas than to respect environmental protection. The fines were generally not paid (https://www.intercept.com.br/2020/01/31/maiores-desmatadores-amazonia/; accessed 28.08.2023).

quality iron ore reserves to be mined. Production started in 2016, the estimated production capacity is 90 mtpy with a high iron content of 66.7%. An increase to 120 mtpy production at site is planned, so that the Northern System's total mining capacity will be 260 mtpy.

S11D will use truckless mining, trucks are replaced by conveyor belts. Shovels and mobile crushers feed directly onto conveyor belts, which take the ore to processing facilities. This lowers environmental impact. Start of the overall project is expected in the first half of 2024. The project includes the opening of new mining areas and the duplication of the long-distance belt conveyor, among other measures. Vale has been investing heavily in this project (US$ 6,4 billion for the mine and about US$ 8 billion in the railroad and port) to intensify the iron ore extraction and export.[301]

To enable export expansion, Vale had to carry out a doubling of around 570 km of the existing Carajás railway line (EFC: today, more than 980 km) and the expansion of the Ponta da Madeira terminal in São Luís. A 101 km rail spur linking to the S11 mining complex in the municipality of Canaã dos Carajás had to be added. Around 35 trains run simultaneously and the EFC operates trains with a length of 3.5 km with 330 cars transporting more than 40 000 t. On average, 55 iron ore trains, 8 general cargo trains and one passenger train run per day going from the mine to the port and back. The total EFC transport capacity is 230 mtpy of iron ore.[302]

Environmentalists and social movements have complained about human rights violations, land confiscation and lack of compensation. About 5000 ha of land claimed for the Vale project was designated as state public land, occupied by *posseiros* or claimed by landless families to create settlements. Vale ignored the claims of dozens of landless families. Since work began in 2016, there have been several widespread protests and about 600 families from seven camps of landless agricultural workers occupied the access road to the S11D project area. The environmental license was fragmented in many parts so that the cumulative environmental and social impacts of the whole project were not considered. "With the approval of S11D, the other licenses (railroad and port) were only a formal matter, there was no real possibility of rejection."[303]

The duplication of the EFC caused numerous protests by the affected population alongside the railway line in Pará and Maranhão. The permanent traffic of huge iron ore trains with noise and air pollution as well as the vibration caused by the trains led to severe health impairment of the population of settlements, the crossed Indigenous territories and numerous *quilombos*. The communities' main complaints include lack of viable ways to cross the tracks, such as overpasses for goods and cattle and footbridges. According to Vale, significant investments have been made along the entire Carajás railway, totalling 48 new viaducts, 80 level crossings, 15 footbridges, 44 automatic gates, among other protective measures. Obviously, however, according to the

301 https://saladeimprensa.vale.com/press-releases, Augus 13, 2020; Vale (2012). https://www.bloomberglinea.com/english/vale-moves-invests-27-billion-amazon-mining-project-to-expand-iron-output, May 19, 2023 (accessed August 28, 2023).

302 https://im-mining.com/2020/08/14/vale-looks-for-increased-operational-flexibility-with-s11d-iron-ore-expansion-plan/ (accessed August 28, 2023). https://saladeimprensa.vale.com/press-releases, August 13, 2020 (accessed August 28, 2023).

303 https://ejatlas.org/conflict/vales-giant-s11d-iron-ore-project-in-carajas-para-brazil (accessed August 28, 2023).

people many of these investments have often not arrived, probably due to corruption of local institutions.[304]

In 2021, 63 % of Vale's iron ore export was sold to China. About half of the new installations in and around S11D were supplied from China. Brazil's leading export partner is China, whose share has increased extraordinarily in the last two decades (2000: 2 % ; 2021: 32.4 %). China is also the main export destination for Brazilian agricultural commodities, e.g., with 70 % of the Brazilian total soybean exports in 2021.[305]

In 2001, after China joined the World Trade Organisation (WTO), Baosteel, a Chinese state-owned company, made its first major direct investment in the Brazilian Amazon region by investing US$ 650 million in the then recently privatised Vale.

Chinese President Xi Jinping's "Belt and Road" Initiative – a 21st Century "Silk Road" – was launched in 2014 to strengthen China's global strategies to improve the world's transport and other infrastructure and provide China with needed raw materials.

In Brazil, economic actors see the construction of railways as the best solution to the logistical nightmare in the Amazon region. Today, many entrepreneurs in Brazil's interior are pinning their hopes for new infrastructure on Chinese investment and construction. The *Ferrogrão* (grain-railway) in Mato Grosso and Pará has attracted particular interest from China, although its construction is still controversial.[306] China is pushing into commodity trade and transport infrastructure construction and is applying its "Belt and Road" strategy to the Brazilian Amazonia and the *cerrado* in particular. Environmentalists have reacted with great concern to the unrestrained "Belt and Road" activities and their presumed negative impact on Brazil.

During President Temer's visit to China for the 2017 BRICS summit, 22 agreements were signed, including approval for phase 2 of the high-voltage transmission line for the Belo Monte hydropower plant and a financing agreement with China Communication and Construction Company (CCCC) for a US$ 700 million investment in the construction of a private terminal at the port of São Luís (Branford and Torres 2018).

In 2017, a US$ 20 billion investment agreement between China and Brazil allowed Chinese state-owned companies – notably State Grid and China Three Gorges – greater control in strategic sectors such as hydropower in Brazil. State Grid Brazil Holding acquired seven national power transmission companies in Brazil, and China Three Gorges Corporation invested in consortia of hydropower plants in the Amazon basin. China purchased a leading Brazilian engineering company, which now operates as a subsidiary of the state-owned Chinese company CCCC, one of the world's largest builders of railways and industrial waterways. In the last decade, 11 out of the 14 Chinese investments in Brazil's Amazon region were made by state-owned companies.[307]

Chinese interests are mainly focused on the supply chains due to the dependence on Brazilian soybeans. Through state-owned COFCO, China's largest food and agricul-

304 https://observatoriodamineracao.com.br/alongside-the-railroad, August 30, 2023 (accessed August 30, 2023).

305 https://www.datamarnews.com/pt/noticias/china-compra-70-da-soja-e-63-do-minerio-de-ferro-exportado-pelo-brasil/ (accessed August 28, 2023).

306 See chapter II.4.4.; Abdenur *et al.* (2021).

307 https://dialogochino.net/en/trade-investment/53558-china-amazon-footprint-evolve-greener-partnership, May 9, 2022 (accessed August 29, 2023). Garcia *et al.* (2023).

tural company, several trading companies have been bought to reduce dependence on the dominant western tradings ABCD (ADM, Bunge, Cargill and Dreyfus) (Branford and Torres 2018).

Land purchases in Maranhão, Tocantins, Piauí and Bahia (MATOPIBA) have also been made. However, many details in this area remain rather hidden so far.

The Manaus Industrial Park,[308] whose special tax legislation has been repeatedly challenged in Brazil in recent decades, has also increasingly attracted Chinese interest in investing in Latin America since the early 2000s. In contrast to the rest of Brazil, in the Manaus Free Trade Zone the main federal tax incentives include a reduction of up to 88 % of the import tax on inputs, an exemption from the tax on industrial products, a 75 % reduction in the corporate income tax and land for the construction of factories at extremely favourable prices (Garcia *et al*. 2023, 38).

The location of the industrial park in the Manaus Free Trade Zone, with numerous companies building televisions, laptops, smartphones, air conditioners, motorbikes and watches, among others, has long been dominated by companies from the US, Europe, as well as Japan and South Korea (Hiratuka 2022).

As early as the 1990s, China was supplying inputs for the factories in Manaus. In 2004, the situation had changed and China was the main supplier of 28 % of all inputs purchased abroad by the state of Amazonas. In 2015, China's share increased to 47 %. In a second phase, the government and business associations of the state of Amazonas have made efforts to attract Chinese investment to the Manaus Industrial Park, with its specialised workforce, low labour costs and tax incentives. China's average investment share increased between 2008 to 2017 from 2 % to 10 %. China became the most important investor in Manaus, surpassing Germany, Japan, France, Finland and Canada, acquiring companies previously owned by enterprises of these countries.

In 2017, Chinese investors – state-owned, semi-public and private companies – owned 22 factories in Manaus: 13 in the electronics sector (televisions, laptops, smartphones), three in the mechanics sector (air conditioners, watches, household appliances), two in the thermoplastics sector (packaging, car parts, adhesive tape) and four in the two-wheeler sector (motorbikes, bicycles). In 2017, these Chinese companies employed about 10 000 workers (direct employees), or about 10 % of the total labour force in the Manaus Industrial Park.[309]

Initially, there were major difficulties for the unions in getting Chinese companies to comply with Brazilian labour standards. Chinese companies preferred to pay a fine rather than complying with a labour court ruling. They generally pay less than the other global players in the manufacturing sector in Manaus, refusing all the additional benefits that used to be granted, such as the provision of childcare places for employees who needed them for their children. "Chinese companies tend to adjust to the Brazilian legislation, but they do not offer any more than what the law stipulates" (Garcia *et al*. 2023, 54).

The working atmosphere is reported to be bad, local managers have no say, everything is decided in China. When factories were taken over by Chinese companies, almost all the workers were dismissed at first, but recruited again a little later, but at a much lower salary. All high-level positions are filled by Chinese, worker training is

308 See chapter I.1.2.4

309 Data and detailed information according to Garcia *et al.* (2023).

almost non-existent (Garcia *et al*. 2023, 54). In Brazil, it is reported that 42 % of the employees of Chinese companies quit their jobs within their first year of employment.

The Shenzhen-based Chinese company BYD with manufacturing operations in Brazil since 2015, opened its third factory in Brazil in Manaus, producing lithium iron phosphate batteries for the electric buses assembled in Campinas: "BYD is quite representative of a new phase of the Chinese economy, which has been increasingly concerned with environmental sustainability and moving toward more knowledge-based and technology-intensive sectors" (Hiratuka 2022, n. p.).

This trend would be a good sign in times of planned future closer cooperation between the two states in a new world order as envisaged by BRICS, which would then, however, also have to affect the respective investment and manufacturing activities.

6.3.2. Forest Code – National Plan on Climate Change – Low-Carbon Agriculture Plan – REDD+ strategy

Shortly after President Rousseff came into office, the struggle over the Forest Code brought a first difficult political situation. "The Brazilian Forest Code (BFC) is one of the only laws in the world with restrictions on how much forest landholders must maintain or restore on their private properties" (Nepstad and Shimada 2018, 17). The part of the property that must be maintained under forest is the so-called "legal reserve," ranging from 80 % in the Amazon rain forest biome, 35 % for *cerradão* in Amazônia Legal, and 20 % for *campos cerrados* outside Amazonia. The Forest Code also requires – in addition to the legal reserve – conservation of permanently protected areas (hilltops, mountain slopes, mangroves, and riparian forests) to preserve biodiversity, maintain water quality, and stabilise soils.

In 1996, the Cardoso Government had raised through a Provisional Measure (*Medida Provisoria*) the percentage of the remaining forest area from 50 % to 80 % due to a massive surge in deforestation in 1995. Farmers can buy land in Amazonia but can only farm 20 % of it. This was followed by five years of fierce disputes with the *ruralistas*[310] until it became federal law in 2001. However, in 2000 the state of Mato Grosso decided that the transition forest (*cerradão*) – about half of the forest area in Mato Grosso – is not counted as an Amazonian forest biome. Farmers in the forest transition area of this state only had to leave 50 % forest, i.e., they could clear half of their forest area. The federal government overturned this decision in 2005. Under the Bolsonaro government, another attempt was launched in 2022 to circumvent the Forest Code for Amazônia Legal.[311]

In 2011, the powerful agribusiness lobby launched a campaign to fundamentally change the BFC. Although the restrictions on forest clearing contained in the BFC remained largely intact, amnesty was given to farmers who had cleared forest illegally prior to 2008. The Forest Code reduced the legal reserve requirement in Legal Amazonia from 80 to 50 %, provided that at least 65 % of a state's territory is allocated as either conservation units or as Indigenous reservations. The Brazilian Academy of Science, the Catholic Church, and environmental organisations (WWF, Greenpeace)

310 The União Democrática Ruralista (UDR) is the association of large landholders and farmers who are opposed to land reform.

311 Cf. chapter III.2.

urged Rousseff to completely veto the bill. In view of Brazil as host of the Rio+20 Earth Summit, the approval of the bill would have set a poor example of sustainability ahead of a conference for setting new aims for the global environment.

In May 2012, President Rousseff partially vetoed the bill that would have weakened the country's efforts to protect the Amazonian rain forests. However, she received much criticism by environmentalists when the congress approved the changes to the Forest Code and the protection for forests along the rivers. Under the Rousseff administration, there was "a marked shift away from environmental protection in an effort to further spur development and economic growth" (Hurwitz 2012, 17). When the Brazilian Supreme Court decided in March 2018 that the revision of the Forest Code was constitutional, a 22-year period of uncertainty ended (Nepstad and Shimada 2018, 17).

It has been nearly impossible to implement and monitor the Forest Code. Clear ownership titles existed for only 10 percent of private land in Amazônia Legal. Therefore, in 2010 the federal government promoted the environmental regularisation of private rural areas and made it mandatory for all rural properties to be mapped and registered through a system known as Rural Environmental Registry (Cadastro Ambiental Rural, CAR). This is a key component of Brazil's strategy to keep deforestation under control.

Although it is a federal law, the Forest Code is implemented at state level. This means that its success depends on government action to regulate and operate its complex rules and instruments, such as environmental compliance procedures, setting up information systems, acquiring technical resources such as satellites and cartographic databases as well as training human resources.[312]

Because of the failure of state agencies to implement the measures designed to support farmers to comply with the higher legal reserve requirement, farmers were frustrated being "vilified as forest clearing criminals" when the role of the state failed (Nepstad and Shimada 2018, 17). Farmers complained that first the government wanted them to deforest in order to promote agricultural productivity, and then told these same farmers to reforest. A large majority of landowners were not actively restoring patches of their land after too many changes of the law over the years. As those that deforested before 2008 were forgiven of environmental crimes, the farmers that invested in restoration felt cheated by the government for following the law, as they could not convert restored forests to other land uses.[313] Finally, it must be noted that it is difficult to put the law into practice, as about 70 % of the deforestation in Amazônia Legal is done illegally.

Towards the end of the government of Lula da Silva, Brazil had started actions in collaborating with the global effort to combat climate change. As part of the emerging countries, Brazil was in favour of common actions but still without commitment to international law. In 2009, the National Plan on Climate Change (PNMC) was launched through federal law. The 2020 deforestation reduction target was formalised, and the

312 https://www.nature.org/en-us/about-us/where-we-work/latin-america/brazil/stories-in-brazil/brazils-forest-code/ (accessed September 4, 2024). The Nature Conservancy, a global environmental non-profit organisation, was working with the states of Pará and Mato Grosso to support implementation of the CAR, as this is the first step toward successfully complying with the Forest Code requirements.

313 https://www.weforest.org/blog/wildlife-corridors/brazilian-forest-code/ (accessed November 30, 2022).

legal and programmatic framework established for achieving it. Under this law, Brazil should take action to reduce between 36 and 39 % of its projected emissions by 2020 (equivalent to a 17 % reduction compared to 2005 levels). This objective included 80 % reduction in deforestation in the Amazon region (target: 3900 km²/year, in relation to the average value of the years 1996–2005: 19 400 km²/year) and 40% reduction in deforestation in the *cerrado* biome.[314]

One of the most ambitious features of this new legislation was the Low-Carbon Agriculture Plan (ABC Plan), designed in 2010 to provide resources and incentives for farmers to adopt sustainable agricultural techniques. The objective is to reduce emissions of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) from agriculture, while generating income for vulnerable rural communities. The Plan includes a credit initiative, which provides low-interest loans for sustainable agricultural practices such as no-till agriculture; restoration of degraded pasture; crop-livestock-forestry integration and agroforestry systems; planting of commercial forests; biological nitrogen fixation; and treatment of animal wastes. Efforts are supported to reduce the role livestock farming expansion and other factors play as drivers of deforestation. The target was reducing annual GHG emissions by 133 to 166 million tons of CO_2eq relative to projected future levels by the year 2020.[315]

Since the Lula da Silva government – as alleged by Brazilian environmental organisations – had delayed the national laws on climate change, the implementation of these new comprehensive projects was reserved for the Rousseff government and represented a great burden due to the complexity of the execution necessities.

At the UN climate conference (COP 21) in Paris in 2015, President Rousseff stressed that climate change resulting from human action is one of the biggest global challenges of current times. Brazil submitted its new climate action plan to the UN Framework Convention on Climate Change in advance of the new universal climate change agreement reached in Paris in December 2015.[316]

Brazil reduced its forest cover clearance in the Amazon region by impressive 84 % between 2004 and 2012. Amazon deforestation achieved a record low of 4571 km² in the year 2011/12 (August 2011–July 2012). A more effective law enforcement through command-and-control measures led to a dramatic drop in deforestation, especially in the "deforestation arc" around southern and south-eastern Amazônia Legal. Illegal logging had fallen, but critics claimed that Brazil had weakened protection measures by revising the Forest Code. However, since 2013 official deforestation rates have been on an upward trend.

By 2013, registered CAR properties covered roughly 32 % (23 million ha) of the areas eligible for registration in Mato Grosso and 57 % (34 million ha) in Pará. Regis-

314 Deforestation data: INPE/PRODES.

315 http://redd.mma.gov.br/en/component/content/article/160-central-content/top-news/616-measuring-reporting-and-verifying-mrv-redd-results?Itemid=0 (accessed December 2, 2022) and https://climatepolicydatebase.org/policies/ (accessed December 2, 2022).

316 https://unfccc.int/process-and-meetings/the-paris-agreement; https://www.gov.br/mre/pt-br/centrais-de-conteudo/publicacoes/discursos-artigos-e-entrevistas/presidente-da-republica/presidente-da-republica-federativa-do-brasil-discursos/discurso-da-presidenta-da-republica-dilma-rousseff-durante-sessao-de-abertura-da-21-conferencia-das-partes-da-convencao-quadro-das-nacoes-unidas-sobre-a-mudanca-do-clima-cop21-paris-30-de-novembro-de-2015 (accessed December 2, 2022).

tered properties in both states suggested that a good part of the producers have joined. This was positive news, but in times of a declining economic export boom it became increasingly clear that the manifold tasks in the environmental sector of Amazonia could not be solved promptly by the far too small number of employees in government authorities on the federal and state side. Due to the social and economic problems in other regions of Brazil, especially in the Northeast, the possibilities to expand the staff for official affairs in Amazônia Legal remained limited.

By the start of Rousseff's second term in 2015, little of the new Amazon objectives had been achieved. The Forest Law, passed in 2012, had granted amnesty to landowners who deforested illegally before 2008. Meanwhile, a measure requiring farmers to register rural properties and restore or provide compensation for illegally deforested areas has been delayed twice.[317] In view of the impunity for illegal logging before 2008, many farmers waited to comply with the requirements of the Forest Code.

In December 2015, Brazil submitted its REDD+ strategy[318] (Reducing Emissions from Deforestation and Forest Degradation) to the UN Framework Convention on Climate Change. The *plus* is referring to the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. Its overall objective is to contribute to global climate change mitigation by eliminating illegal deforestation, promoting conservation and restoration of forest ecosystems, and fostering a low-carbon and sustainable forest economy, delivering environmental, social, and economic benefits. As the first country worldwide, Brazil achieved full compliance with the UN Framework Convention on Climate Change requirements to receive results-based payments within the REDD+ 2013 Warsaw (COP 19) framework (KfW 2017).

The REDD+ function is to provide financial incentives to developing countries for their results achieved in combating deforestation and forest degradation and in enhancing forest cover. Through this instrument, countries that produce verified results of forest-related greenhouse gas emission reductions and enhancement of forest carbon stocks become eligible to receive results-based payments from various international sources, in particular the Green Climate Fund (GCF). In order to achieve the overall objective, integration of the governance structures of climate change, forest and biodiversity related policies is indispensable, seeking to promote consistency and synergies among them at the federal, state, and municipal levels (Gebara 2017).[319]

In 2017, the ENREDD+ strategy was completed with an Amazon Forest Reference Level approved by the UN Framework Convention on Climate Change, a national registry of emissions reductions, and an agreement for the distribution of emissions reductions among the national governments and state governments of Amazônia Legal.

ENREDD+ will be guided by the National Policy for Climate Change and the Forest Code. It identifies three sectoral plans for implementing ENREDD+: the Action Plans to prevent and control deforestation and fire in the Brazilian Amazon (PPCDAm) and in the *cerrado* (PPCerrado) and the Plan for Low-Carbon Agriculture (ABC) (Gallo *et al*. 2020).

317 https://www.foreststreesagroforestry.org/tag/enredd/ (accessed December 2, 2022).

318 Brazilian national version: ENREDD+ strategy.

319 http://redd.mma.gov.br/en/component/content/article/160-central-content/top-news/644-newsletters?Itemid=0; https://unfccc.int/news/forest-protection-in-brazil-boosted-through-redd-plus (accessed December 3, 2022).

In practice, REDD+ projects subsidise the conservation of forest areas. In addition to preserving the carbon stored in these areas, they lead to the conservation of biodiversity and bring social benefits to the region. Although the ENREDD+ programme was at an early stage, a promising agreement between the German government and the government of Acre, in alignment with national Brazilian policies, may be discussed briefly.[320] Acre's particular distinction as an "early mover" lies in its long-term experience of integrating intersectoral policies and programmes within a pro-forest land-use planning approach. Recognizing Acre's environmental achievements in reducing deforestation, Germany provided funding for emission reductions. As a key component of this partnership, the two governments agreed to pilot a results-based REDD+ system in the context of the Official Development Assistance.

Already in 2010, Acre's state government established the System of Incentives to Environmental Services (SISA) with the objective to conserve and recover a broad array of environmental services as a policy framework for sustainable development. In 2012, Germany committed € 16 million in results-based finance to be implemented through the German REDD Early Movers (REM) programme from 2012–2016 and strengthened the programme with an additional € 9 million. The REM programme rewards pioneers of forest protection and climate change mitigation. In 2015, Acre was the first jurisdiction that developed and applied a REDD+ Social and Environmental Standards (REDD+ SES) initiative, following a multi-stakeholder process. Sub-programmes like sustainable smallholder agriculture, Indigenous communities, extractive reserves, and sustainable and diversified animal farming are financed and promising results could be expected. The challenge for Acre will be further continuation of the downward trend in deforestation and providing positive incentives for this process. As the remaining deforestation is more dispersed among very many mid- and small-scale farms, which are more difficult to monitor and to reach, this initiative becomes increasingly difficult, independent of political uncertainties (KfW 2017).

In Brazil, REDD+ promoted changes in the political articulation, funding possibilities and mobilisation of civil society, and brought more visibility to the importance of combating deforestation and forest degradation. However, "lack of political commitment, inefficient forest resource governance, insufficient enforcement of the environmental legislation, social inequalities and land use conflicts remain" (Gallo *et al*. 2020, 5). The early criticism about the limitations of environmental policies considering the potential of REDD+ to contribute to sustainable local development is still justified, as the environmental and social initiatives frequently disregard the capacities of smallholders (Pokorny *et al*. 2013). The legal regulatory policy still is based on the conflict of interests between a national legislation that fosters trade and commercialisation of agricultural commodities, but also promotes exploitation of natural resources, and ignores sustainable use and conservation principles. The growing national and international demand for forest and agricultural commodities, and subsidies that encourage the production of such commodities drive deforestation and the evolving issues of the different actors, especially the private sector (Gebara 2017).

There is a need to align institutional discourse with actions executed and a strong political will for generating sound regulatory frameworks. Brazil was a pioneer in its initial efforts to reduce deforestation. However, the scenario has drastically changed,

320 Based on a report of KfW (2017).

and all efforts made so far will not be sustained without political reforms and the implementation of a sustainable forest management.

At the beginning of her second term in 2015, President Rousseff's decision to appoint an outspoken sceptic of climate change, Aldo Rebelo, as Minister of Science and Technology caused controversial reactions, after a decade in which Brazil had reduced Amazon deforestation and claimed a leadership role in international climate policy. However, this was not the only appointment to cause surprise and dismay in the PT and environmentalist circles. Rousseff named Kátia Abreu, often referred to as "chainsaw queen" in the popular press, as Minister of Agriculture, an assertive agribusiness lobbyist and opponent of environmental circles or Indigenous peoples' land rights in the Brazilian Senate. These appointments indicated political constraints and coalition necessities and no particular interest in attracting support from the environmental movement by pro-Amazon initiatives while pushing for major dams that will only increase pressure on forests. The Rousseff administration spent 72 % less money on anti-deforestation measures than her predecessor Lula da Silva.[321]

The country's disappointing economic performance as well as the poor delivery of public services became obvious, especially in light of the billions spent by the government on infrastructure in major sporting events, agreed during the presidency of Lula da Silva: the World Football Championship in 2014 and the Olympic Games in Rio de Janeiro in 2016. This led to sustained protests by large sections of the population. Rousseff's approval rating was at just 10.8 %. Of course, the financing of social and environmental programmes in Amazonia suffered and the political interest in this region faded into the background.

President Dilma Rousseff was impeached in August 2016 and the Senate removed her from office after six years in power. She was charged with criminal administrative misconduct and disregard for the federal budget in violation of article 85 of the Constitution of Brazil and the Fiscal Responsibility Law. The petition also accused Rousseff of criminal responsibility for failing to act on the scandal at the Brazilian national petroleum company. However, she was not denied political rights.

Rousseff's supporters called the impeachment a *coup*, though it had been approved by the Supreme Court, as well as by large majorities in both houses. Secretly recorded phone conversations confirmed that Rousseff had been ousted because she would not call off the "car wash" investigation (Watts 2017). Vice-President "Temer played a central role in the impeachment of Dilma Rousseff, who was impeached for illegally using money from state banks to bankroll public spending" (Kaiser 2019, n. p.). In 2018, the PT officially launched Rousseff's candidacy for a seat in the Federal Senate from the state of Minas Gerais, but she was defeated for her Senate run.

6.3.3. Amazônia Legal under the Temer government: Change of political party without change of strategies for Amazonia

Michel Temer (Brazilian Democratic Movement Party, PMDB) served as Rousseff's Vice President for six years. He became president in 2016, taking office after the impeachment of Rousseff, even though he was mentioned multiple times in the "car

321 InfoAmazonia, March 31, 2015. https://desmatamento.infoamazonia.org/analise/ (accessed December 3, 2022).

wash" investigation.[322] Temer has moved rapidly to unravel environmental protections to please the powerful agricultural and mining lobbies (Watts 2019). He ensured his survival by proposing to ease restrictions on everything from mining to ranching in protected forests. Dams like Belo Monte were confirmed by the Temer presidential administration in 2016, which, like the PT predecessors, was committed to the regional development in Amazônia Legal by means of large hydroelectric power plants with reservoirs.

Temer has stepped back from Brazil's commitment to protect the Amazon region and his government appeared to be unwilling to take the necessary measures to combat deforestation which increased rapidly. This neglect had negative consequences as the government of Norway, main sponsor of the Amazon Fund, announced a cutback in funding due to the rise in forest destruction. Norway had invested more than US$ 1.1 billion since 2008 to help Brazil protect the forests. The Temer government prepared a new law that opened up the Jamanxim national forest in the state of Pará to the private sector, even though Temer vetoed earlier legislation that would have reduced national forests by 600 000 ha (Poirier and Millikan 2017).

In August 2017, Temer issued a rain forest decree to dissolve the Reserva Nacional do Cobre e Associados, an Amazonian reserve in the states of Pará and Amapá, measuring four million ha to allow mining by private companies and the conversion of forest into crops for agribusiness companies. The decree was revoked after widespread criticism because this would open the door for mining companies to enter the reserve which was set up in 1984 (Watts 2019).

National and multinational firms had expressed an interest in the region, which most probably contains deposits of gold, copper, tantalum, iron ore, nickel, and manganese. Commercial exploitation by big companies in the past has been followed by illegal land grabbers, *garimpeiros*, and road construction workers. Temer's decision threatened to reduce protected areas, to weaken environmental licensing, and diminish Indigenous rights in the interests of the small group of economically powerful companies which were keeping Temer in power.

President Temer signed a legal opinion that directs his government's administration to paralyse all Indigenous land demarcations in the country.

> The move continues a string of devastating assaults on human rights and environmental protections that blatantly cater to Brazil's regressive "ruralista" agribusiness lobby, which Temer is courting in the run-up to a congressional vote […] that could remove him from office to face charges of rampant corruption (Poirier and Millikan 2017).

This measure was an illegal attempt to strip Indigenous peoples of their rights since Brazil's 1988 Constitution to permanent and exclusive use of their territories, claiming these rights cannot overrule "national interests" such as military operations, road construction, communications infrastructure, and hydroelectric dams. Temer wanted to keep his job at any cost, which required the votes of the *ruralista* bloc.

Temer had appointed senator Blairo Maggi, Brazil's new "soybean king," as Minister of Agriculture. Maggi, a prominent member of the *ruralistas*, supported arguments for a "land reform" in their sense so that protected forests for both the environment

322 Cf. chapter II.6.1.

and Indigenous communities could be cleared for farming, cattle ranching, and mining to create jobs and spur growth.

As investigations referring to the operation "car wash" intensified and after some failed attempts to start impeachment processes against Temer, in June 2016 the president received an eight-year ban from running for office in the presidential campaign for the 2019–2022 period, after being convicted of violating election laws.

In May 2017, secretly taped recordings leaked by *O Globo*, a leading national newspaper, revealed the president discussing to keep up hush money payoffs to a politician convicted of taking bribes with Joesley Batista, the boss of the country's biggest meat-packing firm JBS, the world's leading beef exporter. The Batista family is one of the most influential lobbyists of an expansion of cattle grazing in Amazonia. The firm was investigated over accusations of paying kickbacks to a former speaker of the lower house of Congress who is serving a 15-year sentence for his role in the Petrobras scandal.[323] Thousands of angry demonstrators marched towards the Congress demanding Temer's resignation and immediate direct presidential elections. As president, he was shielded by the immunity of office.

In 2017, Brazil's federal police said that investigators had found evidence President Temer received bribes to help businesses. Prosecutors alleged that Temer was the leader of a "criminal organisation" that took in US$ 472 million in bribes or pending future kickbacks as part of numerous schemes, including the Angra nuclear power plant complex and other state firms. The president's party PMDB long controlled key appointments in Brazil's largely state-run energy sector, including nuclear power plants. Temer was hit with separate corruption charges during his presidency that were blocked by his allies in the Congress, which must authorise charges against an acting president. Additionally, Temer was formally accused of conspiracy against corruption inquiry. He had been a part of schemes diverting public funds since the 1980s said the federal prosecutor.[324] "Temer was more worried about his own job, than the Amazon and the people who live there" (Poirier and Millikan 2017, n. p.).

He completed Rousseff's term until the end of 2018 and, like Lula da Silva, was banned from participating as candidate in the presidential election in October 2018. In March 2019, Temer was arrested during the investigation into operation "car wash." Temer was the second former president – after Lula da Silva[325] – to be arrested in the anti-corruption investigations. In March 2019, a *habeas corpus* was issued on behalf of Temer, who had left office with an approval rating of 7%.

323 *The Economist*, May 20, 2017, https://www.economist.com/the-americas/2017/05/20/leaked-recordings-are-trouble-for-michel-temer (accessed December 13, 2022).

324 CNBC, Reuters, June 27, 2017, https://www.cnbc.com/2017/06/26/brazil-president-michel-temer-charged-with-corruption.html?&qsearchterm=Temer (accessed 13.12.2022).

325 Lula da Silva was imprisoned in April 2018 after a sentence over 12 years for corruption handed down by the controversial judge Moro. In November 2019, Lula da Silva was released from prison after 19 months. The Supreme Federal Court annulled all convictions against Lula da Silva on March 2021, ruling that the court in Curitiba, which convicted him, lacked jurisdiction to do so. Thus, he was able to run for the presidential elections in October 2022 and he won the election for the 2023–2026 term.