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Mongabay Series: Amazon Infrastructure

Brazil's Amazon dam plans: Ominous warnings of future destruction (commentary)

Commentary by Philip M. Fearnside on 22 October 2020

- *Brazil's current 10-year Energy Expansion Plan calls for three more large dams in Amazonia by 2029, and Brazil's 2050 National Energy Plan lists many more.*
- *Both plans contain ominous passages explaining that the list of dams could expand if "uncertainty" is resolved regarding current regulations protecting Indigenous peoples and protected areas for biodiversity.*
- *Brazil's National Congress is considering bills to eliminate environmental licensing; a bill submitted by President Jair Bolsonaro would allow dams on Indigenous lands. Brazil's dam-building plans to satisfy 2050 energy demand extend to neighboring Amazonian nations, including Peru and Bolivia.*
- *The 2050 plan essentially admits that dams on Indigenous lands and within other protected areas are not necessary because the electricity could be generated by offshore wind power. This post is a commentary. The views expressed are those of the author, not necessarily Mongabay.*

The Santo Antônio dam (seen here) and Jirau dam were documented to have significantly contributed to disastrous upstream flooding on the Madeira River in 2014, extending out of Brazil into Bolivia. Today, both dams block aquatic migrations and have negatively impacted river fisheries. Image courtesy of Santo Antônio Energia.

Every year Brazil's Ministry of Mines and Energy publishes a "Decennial Plan for Energy Expansion," which includes the "large" dams (since 2004 defined in Brazil as having at least 30 MW installed capacity) to be completed within the ten-year time horizon.

The number of Amazonian dams listed has steadily declined in the last few plans, a fact that the plans make clear is due to "uncertainty" about current licensing policies restricting impacts on the environment and on Indigenous peoples. The most recent plan, which is for 2020-2029, lists only three dams: Tabajara (in Rondônia), Bem Querer (in Roraima), and Castanheiras (in Mato Grosso). A longer list of dams to be completed "after 2029" is also included, but the most controversial dams are also not included in it.

The 2020-2029 plan contains an ominous paragraph (p. 264) making clear that unnamed dams could be built depending on the "treatment" of conservation units (protected areas for biodiversity) and Indigenous Lands. In other words, more and more-damaging dams could be built if regulations are changed, as is proposed in bills currently moving through committees in Brazil's National Congress.

This is not a remote possibility, as Brazil's environmental regulations have been being dismantled since the mid-2000s, and this process has accelerated enormously since Jair Bolsonaro became president in January 2019. Several proposed laws would effectively eliminate environmental licensing. There is also a proposed law introduced by President Bolsonaro that would open Indigenous lands for exploitation by non-indigenous people — hydroelectric development is one of the uses specifically mentioned, development which could be carried out without requiring consent of the Indigenous groups impacted.

In addition to the ten-year plans, Brazil also has periodic “National Energy Plans.” The most recent one, which completed its public comment period on October 13, extends to 2050. This plan also omits the most controversial dams such as the Babaquara (renamed “Altamira”) Dam on the Xingu River upstream of Belo Monte. However, the report’s list of potential dams (Figure 1) includes the Chacorão Dam on the Tapajós River, which would flood part of the Munduruku Indigenous Land, as well as other dams on the Tapajós and its tributary the Jamanxim River that would flood part of Sawré Mubyu, a Munduruku area that has had its official status as an “Indigenous land” blocked precisely to make way for these dams.

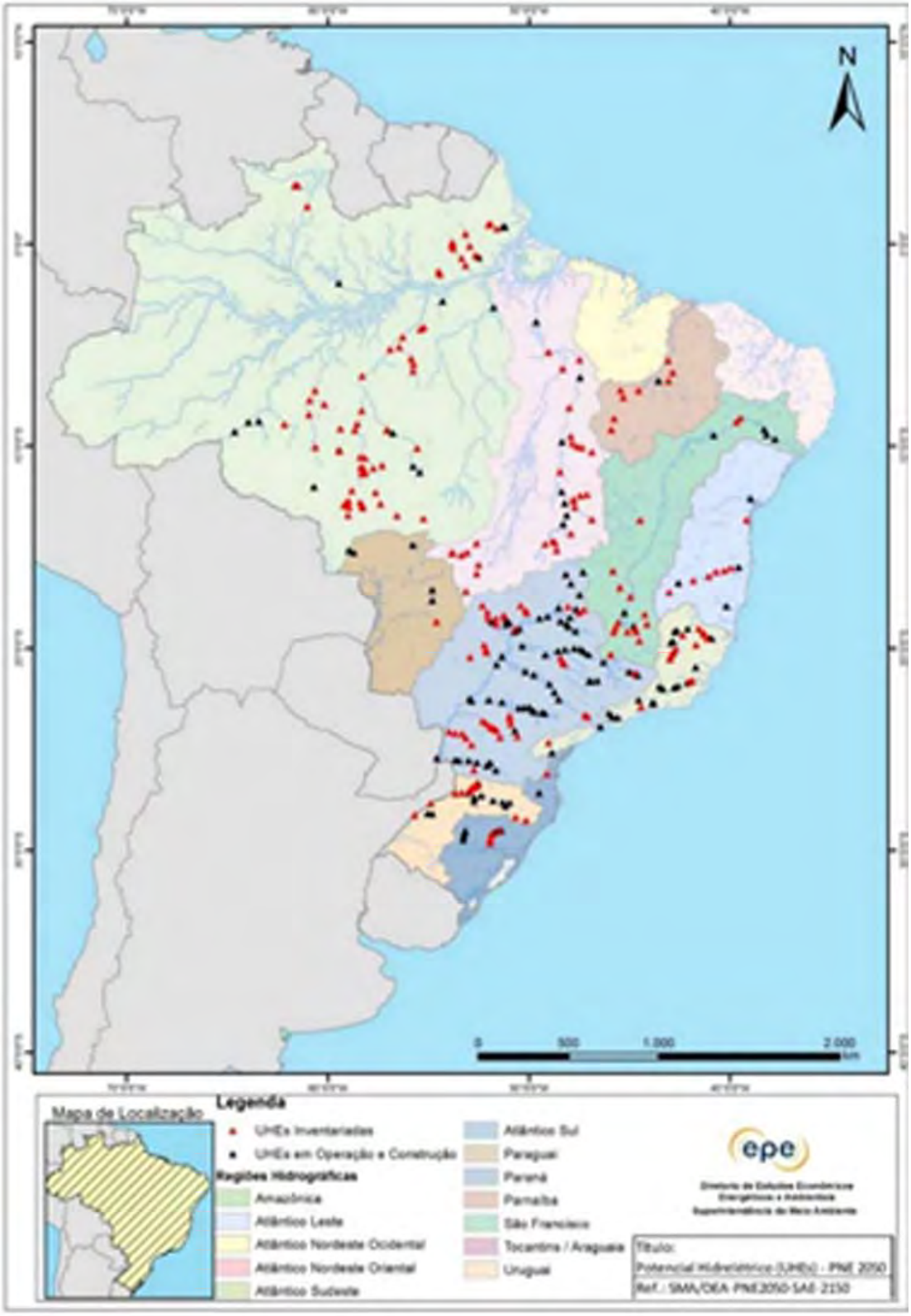

Figure 1. Map from Brazil's 2050 National Energy Plan (p. 77) showing dams with at least 30 MW installed capacity that are completed or under construction (black triangles) and dams under consideration for future construction (red triangles).

The omissions in the 2050 National Energy Plan are intriguing. For example, the map of planned transmission lines omits the line from Manaus to Boa

Vista, the capital of Roraima state (p. 191). It is included in the 2029 10-year plan (p. 105). This line would pass through the Waimiri-Atroari Indigenous Land and requires consultation. Yet the planned Bem Querer Dam in Roraima, which would use the line to transmit most of its output to Manaus, is moving ahead quickly and is scheduled for completion in 2028 according to the 2020-2029 10-year plan (p. 57).

Dam plans can appear out of nowhere, as with the Barão do Rio Branco project announced soon after Bolsonaro took office. This project would build a 2,000-MW dam on the Trombetas River (Figure 2) together with a road connecting the Amazon River to the border with Suriname on a route that is almost entirely composed of conservation units (protected areas for biodiversity), Indigenous Lands and *Quilombola* Lands. "*Quilombolas*" are descendants of enslaved Africans who escaped in past centuries and set up their own villages in the forest; they have the same rights as Indigenous peoples under Brazil's 1988 constitution. Bolsonaro's planned dam would flood *Quilombola* Lands.

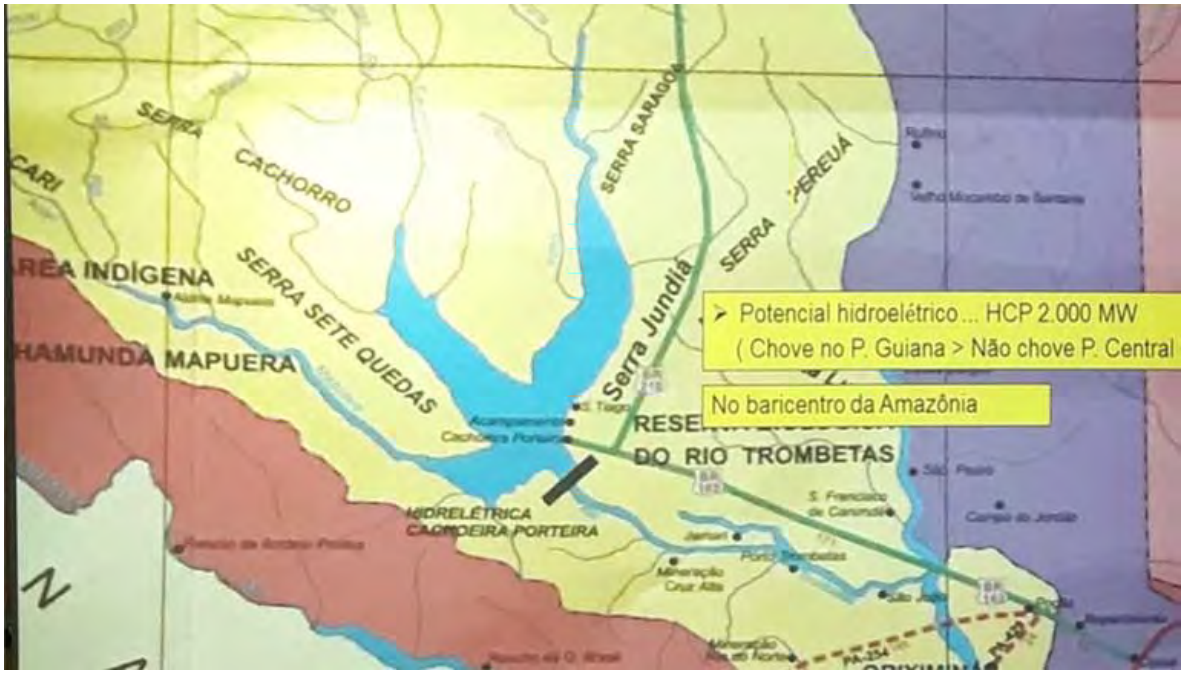

Figure 2. A leaked map obtained by The Intercept showing President Bolsonaro's plan for a dam on the Trombetas River.

Peru, Bolivia and Ecuador also have big plans for Amazonian dams. The 2010 Brazil/Peru agreement specified six large dams in the Amazonian part of Peru to be built by Brazilian construction firms with financing from Brazil's National Bank for Economic and Social Development (BNDES), largely to export electricity to Brazil (Figure 3). Since 2010 the "*Lava Jato*" ("Car Wash") corruption scandal in Brazil has tainted the main construction firm expected to build the dams (Odebrecht), as well as various political figures in Brazil and in the other Amazonian countries. In addition, Brazil's economy has not been doing well, and BNDES has less money to invest than it once did. Nevertheless, many of these dams are listed in Brazil's 2050 National

Energy Expansion Plan as possible sources of electricity in the coming decades (Figure 4).

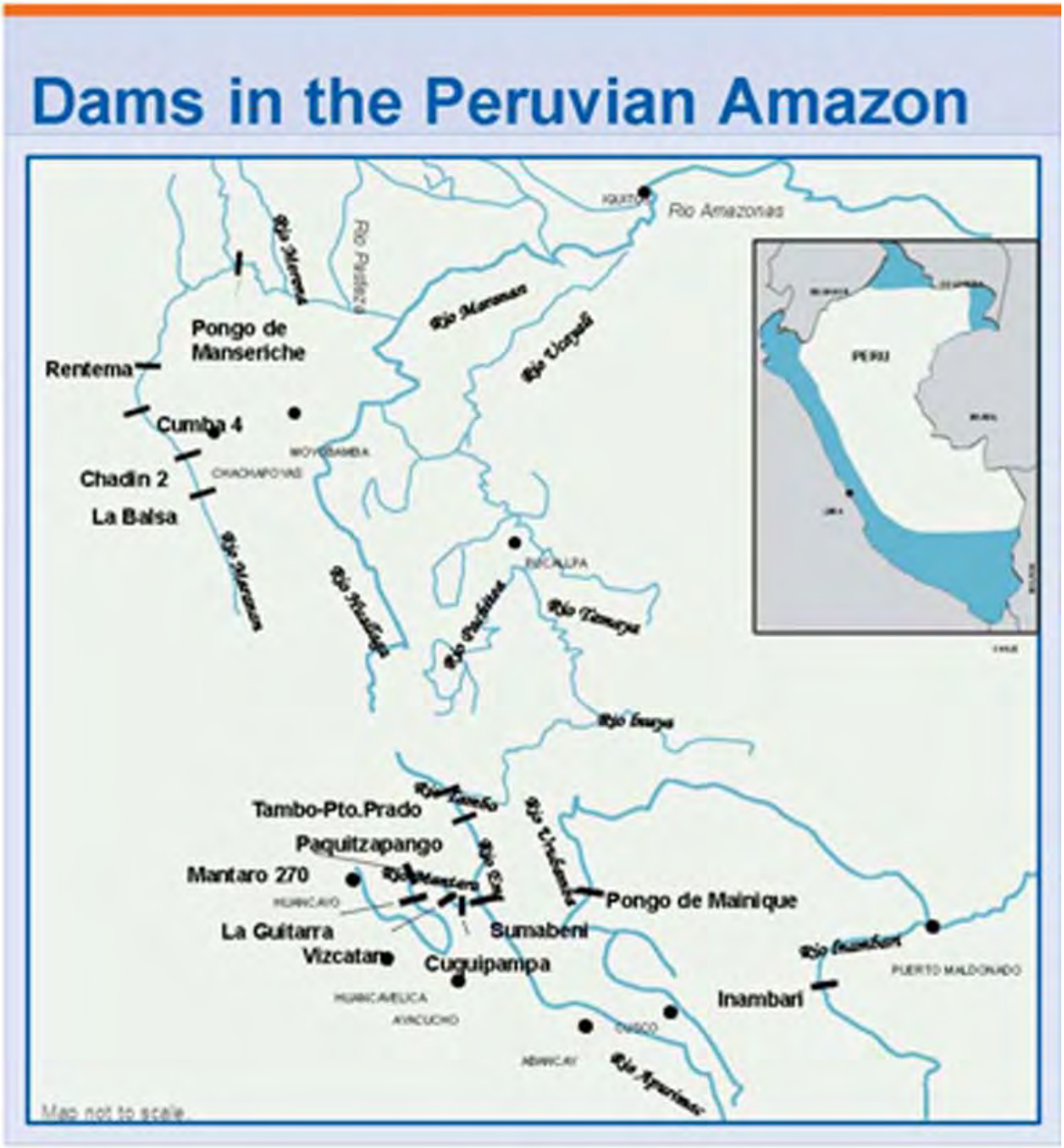

Figure 3: Planned dams in Peruvian Amazonia. Source: International Rivers.

Tabela 6. Projetos internacionais

Usina	Local	Potência Instalável (MW)
La Guitarra	Peru	220
Aña Cuá	Paraguai / Argentina	270
Man 270	Peru	286
Ampliação de Yaciretá	Paraguai / Argentina	465
Tampo-Pto. Prado	Peru	620
Vizcatá	Peru	750
Cuquipampa	Peru	800
Cumba 4	Peru	825
La Balsa	Peru	915
Urub 320	Peru	942
Cachuela Esperanza	Bolívia (50 hz)	990
Panambi	Argentina / Brasil	1.050
Sumabeni	Peru	1.074
Garabi	Argentina / Brasil	1.150
Ina 200	Peru	1.355
Paquitzapango	Peru	1.379
Rentema	Peru	1.525
Itatî – Itacora	Paraguai / Argentina	1.600
Bala	Bolívia (50 hz)	1.680
Corpus Christi (Pindo-I)	Paraguai / Argentina	2.880
Río Grande	Bolívia (50 hz)	2.882
Guajará-Mirim	Bolívia (50 hz)	3.000
Pongo de Manseriche	Peru (60hz)	7.550
Total		33.998

Fonte: Elaboração a partir de fontes diversas.

Figure 4: List of planned dams in countries neighboring Brazil from which the 2050 National Energy Plan (p. 90) considers that electricity could be exported to Brazil.

The dams Brazil plans to build in Peru and Bolivia would have many impacts on the environment and on the people who live along the rivers in these countries. Ironically, they also would have impacts in Brazil itself. A study by Bruce Forsberg and coworkers showed that these planned dams would retain enough sediments to significantly reduce the transport of this valuable material into the Brazilian part of the basin. Nutrients in, and associated with, these sediments represent the base of the food chain for fish. As a result, the fisheries along the entire length of the Amazon River would see reduced production.

The fact that Brazil would be “shooting itself in the foot” by building these dams does not mean that they won’t be built. After all, Brazil dammed the Madeira River with the Santo Antônio Dam in 2011 and the Jirau Dam in 2013, thus sacrificing much of what had been the world’s second-greatest

riverine fishery, second only to the Mekong (which is also threatened by dams). Fish catches plummeted due to the two Madeira dams, not only in Brazil but also in Bolivia and Peru because of the blockage of fish migrations.

In Bolivia, the same type of arrangement as in Peru applies to at least two planned dams. Brazil has also considered building a dam in Guyana, which could be connected to the planned Boa Vista-Manaus transmission line. All of these dams would have major environmental and human impacts, and the other Amazonian countries generally have even weaker legal protections than Brazil. This fact appears to be part of the reason for building these dams abroad, as the secretary of planning of Brazil's Ministry of Mines and Energy as much as confessed in 2012 in admitting that the foreign dams had priority because they would be faster to approve and build.

As compared to previous energy plans, one improvement in the current plans is that they foresee a substantial increase in wind energy. While the plans for wind power still focuses on onshore generation, the 2050 plan has calculations of the enormous potential for wind power on the continental shelf along the Brazilian coast. The plan admits that "The total expected installed capacity of wind power in 2050 may be even greater than 200 GW… as long as the expansion of hydroelectric dams with interference in protected areas is not allowed" (p. 101). In other words, Brazil could get all of the electricity it demands by tapping this wind resource without needing to allow hydroelectric dams to be built in the country's Indigenous Lands and conservation units (protected areas for biodiversity).

The 2050 National Energy Plan shows that by 2050 Brazil could install 89 GW of "centralized" photovoltaic solar power (i.e., not counting "distributed" panels on rooftops), and that this would make up the difference in foregone hydroelectric generation if restrictions are not removed on Indigenous land and protected areas (pp. 111-112). If restrictions on hydropower are relaxed, less centralized photovoltaic solar (42 GW) would be installed. These numbers for solar power assume that wind power will be installed on a large scale. If some restriction prevents this, then centralized photovoltaic solar power could be expanded to over 100 GW (p. 112).

For comparison, Brazil's total potential installed capacity of untapped hydropower is only 52 GW, and of this only 12 GW (23%) does not interfere with indigenous lands and other protected areas (p. 79). The 2050 plan's repeated inclusion of scenarios with flooding within Indigenous lands and conservation units undoubtedly reflects the expectation of Brazil's electrical authorities that protection of these areas against flooding by dams will indeed be eliminated.

The 2050 plan assumes that hydropower is the cheapest, and therefore the most desirable option, followed by wind and then solar. However, dams are by no means cheap energy, as shown by a worldwide survey of hundreds of

dams that found that most are uneconomical because they almost always cost much more than originally estimated and they routinely take longer than expected to begin generating electricity. Brazil's Belo Monte Dam is a good example: it cost more than double the original expectation and completion took longer than planned. The importance of the high financial cost of dams pales in comparison to that of their human and environmental impacts, which are far greater than those of wind and solar power.

The plans could be more ambitious in the area of energy conservation. The 2020-2029 Ten-Year Plan calculates that 4.8% of Brazil's projected electricity use in 2029 could be avoided through conservation measures (p. 220). The 2050 National Energy Plan has many calls for energy efficiency, but no calculations of how much electricity use could be avoided. Ever since the 2008 National Plan for Climate Change (PNMC), the government's goal has been to end use of the electric showerheads that, according to the PNMC, consume 5% of all electricity in Brazil (p. 58), but basically nothing has been done. There is no mention in any of these plans of stopping the export of electricity in the form of aluminum and other electro-intensive products (7% of Brazil's electricity use).

Banner image: The Tucuruí hydroelectric dam on the Tocantins River in Pará state, one of the first mega-dams built in the Brazilian Amazon. Image courtesy of International Rivers.