

This file has been cleaned of potential threats.

If you confirm that the file is coming from a trusted source, you can send the following SHA-256 hash value to your admin for the original file.

4518434ffd67850d6a0e4a90b6ab47304cfd65a2caaf21cefca6687398944726

To view the reconstructed contents, please SCROLL DOWN to next page.

<https://news.mongabay.com/2020/04/brazilian-government-office-responds-to-fearnsides-br-319-oil-gas-commentary/>

Mongabay Series: [Amazon Conservation](#)

Brazilian government office responds to Fearnside's BR-319 oil & gas commentary

Commentary by [Philip M. Fearnside](#) on 8 April 2020

- *On 9 March 2020, Mongabay published a commentary written by Philip M. Fearnside on the “Solimões Sedimentary Area”, an oil and gas project that would implant thousands of wells spread over the western portion of the Brazilian Amazon, to the west of Highway BR-319 – a forest area almost entirely intact due to lack of road access. According to the commentary, the project would bring many risks to the area: oil spills, impact on isolated indigenous tribes and deforestation due to the expansion of a road network.*
- *EPE, the Brazilian Energy Research Office, sent a response to Mongabay on 27 March 2020 (published below), claiming “conceptual mistakes.” It argues, among other objections, that the Solimões project’s main goal is to evaluate future scenarios for a potential oil and gas exploration system in the area, not a de facto implementation of this system. The office also mentions the participatory process in which the local communities were allegedly involved and, concerning the risk of deforestation, refutes it saying that this kind of operation is mainly done by air or navigable rivers.*
- *As a rebuttal to EPE’s response, also published here, Fearnside objects that the project is a “trial balloon” to see what criticisms will arise so that the authors of the impact assessment can be more prepared to ensure approval of the environmental licenses. Furthermore, Fearnside emphasizes that the opening of a new frontier can stimulate the government to build roads and attract other activities linked to deforestation, like logging, land grabbing and palm oil production.*

The Brazilian Energy Research Office response is to [this commentary written by Philip Fearnside on March 9, 2020](#)

Oil & gas environmental strategic study as a tool for conflict mitigation in the Amazon

The Brazilian Energy Research Office (EPE in its Portuguese acronym) is a public company that has the institutional duty to develop studies supporting the national energy planning (<http://www.epe.gov.br/en>), conducted by the Ministry of Mines and Energy. The studies cover engineering, economics, modeling, policy, social and environment areas to forecast energy demands for the next 10 (<http://epe.gov.br/en/publications/publications/pde-2027-executive-summary>) and 30 years (<http://epe.gov.br/en/publications/publications/demand-response-concepts-regulatory-aspects-and-energy-planning-%e2%80%93-executive-summary>) and necessary infrastructure to meet them (powerplants, transmission lines, oil & gas production, pipelines), minimizing costs and impacts for the energy matrix.

Among those studies, there is the “Solimões sedimentary area environmental assessment” (EAAS Solimões in its Portuguese acronym) (<http://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/estudo-ambiental-de-area-sedimentar-do-solimoes>), observed by the commentary “*Oil & gas project threatens Brazil’s last great block of Amazon forest*” (9 March 2020 by Philip Fearnside). Due to conceptual mistakes on the cited commentary that may harm the critical knowledge of the society about the study, EPE team has prepared this text to elucidate information concerning the Solimões study and the oil & gas activities in the region.

1. **Solimões Sedimentary Area Environmental Assessment is a Strategic Environmental Assessment (SEA) and not an Environmental Impact Assessment (EIA)**

There is a great difference in scope and legal framing between these two assessments. EIA is a required study to obtain a project or activity’s environmental permit, i.e., it is a local study that considers site-specific environmental and social features and sensitivities on one hand, and project design on the other hand. SEA has a broader range analysis that takes into account public policy strategies for regional development and aims to contribute to the policy decision process, by anticipating discussions and reducing conflicts that could appear only in EIA. Then, EAAS Solimões resembles a SEA, representing a tool for environmental analysis on a strategic scale and should be seen as an improvement in energy and environment sectors’ debate in Brazil. Other countries regularly elaborate SEAs, as the United Kingdom (<https://www.gov.uk/government/collections/strategic-environmental-assessments>) and Portugal (<https://apambiente.pt/index.php?ref=17&subref=147>), following a European Commission SEA Directive (Directive 2001/42/EC – <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32001L0042>).

SEA is a tool that supports decision-making process, as proposed by the commentary’s author in one of his citations: “*Most importantly, fundamental changes are needed in the decision-making process to arrive at rational decisions*”

*on oil development (or on any other form of development). These decisions need to be made with information on environmental and social impacts in hand and with institutional mechanisms for democratic discussion of the issues involved **before** (original emphasis) the decision to implement a project is made in practice” (Azevedo-Santos, V.M., J.R. Garcia-Ayala, P.M. Fearnside, F.A. Esteves, F.M. Pelicice, W.F. Laurance, R.C. Benine. 2016. Amazon aquatic biodiversity imperiled by oil spills. Biodiversity and Conservation 25(13): 2831–2834.)*

Thus, as differences between SEA and EIA are clarified, it is incorrect to say that Solimões Sedimentary Area Environmental Assessment authorizes or set up oil & gas projects or activities. It is also incorrect to mention EAAS Solimões as a “*project that would implant thousands of wells*”. It is not a project and *it does not implant wells, nor “allow the drilling of wells”*. Any new oil & gas activity in the region will need to obtain environmental permits, according to national and state laws.

The EAAS Solimões main goals are: a) map suitable, not suitable and moratorium areas for likely future oil and gas development in the high potential oil & gas zone; and b) present institutional guidelines, environmental licensing recommendations, and action plans to enhance region’s social and environmental management and sustainable development.

For that purpose and as a strategic study, EAAS Solimões used different prediction and evaluation techniques. Scenarios analysis was one of them, which allowed foreseeing and comparing different possible futures by taking into account: region’s social and economic tendencies; oil & gas technical and technological capabilities; and region’s oil & gas attractiveness. Other relevant technique used was map overlay: with geoprocessing tools, it was possible to map social and environmentally sensitive areas. Besides that, there were interviews with experts, workshops with experts and local communities, public hearing, etc.

For more information on oil & gas potential in Brazil, check the National Oil & Gas Zoning (<http://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/zoneamento-nacional-de-recursos-de-oleo-e-gas>).

2. Onshore oil & gas exploration and production activities

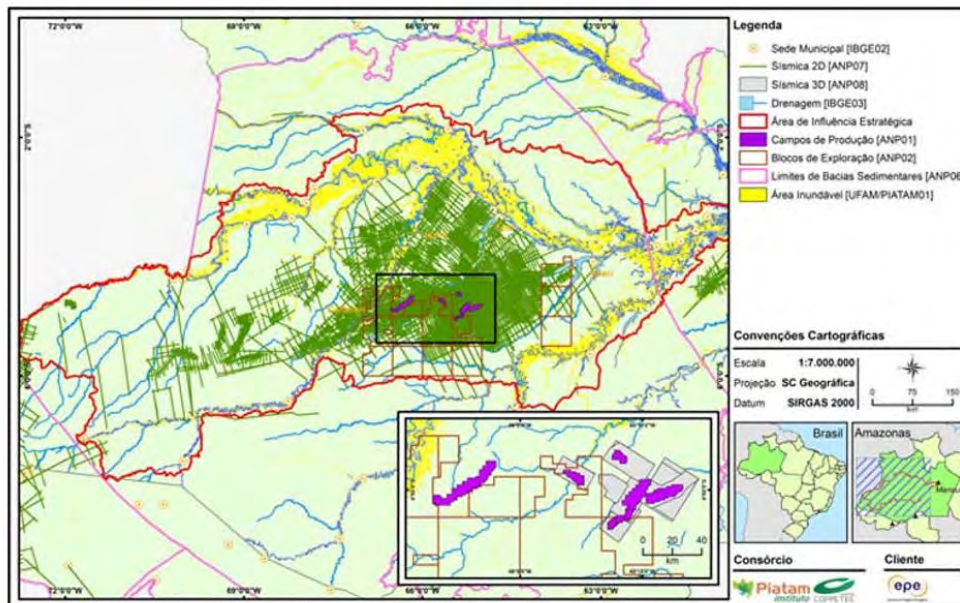


Figure 1. Map of drilling blocks (EIA, p. 56). The purple areas have wells currently in production. The thin green lines represent the locations for future drilling. The project's "strategic area of influence," outlined in red, is larger than the US state of California.

The cited commentary presents a copy of a map from the study, stating that such map locates future drilling sites. However, the map, reposted here, shows seismic lines, as written in Portuguese on the original figure ("Sísmica 2D"), and not "locations for future drilling", as stated in the commentary. A Seismic survey is one of many methods used to assess where it is possible to find an underground oil and gas reservoir. It allows companies to understand the geological features by producing seismic waves that are reflected differently by diverse rocky layers. The different signals produced are interpreted in a search for geological traits that indicate the existence of oil or gas. With seismic results on hand, companies decide where to drill a well, reducing economic risks. The green lines in the map show where those seismic data were already obtained at Solimões basin.

As shown in Figure 1, it takes a long process to start oil and gas production. We highlight that the EAAS Solimões is at the planning phase. After that, selected areas are offered in bidding rounds and if a company is successful in acquiring it, the exploration phase starts. The first wells are exploratory and they help determine if there are oil and gas and if the reservoir will be economically viable. When one of these wells shows to be promising, the company declares its commerciality, builds the production infrastructure and drills the production wells.

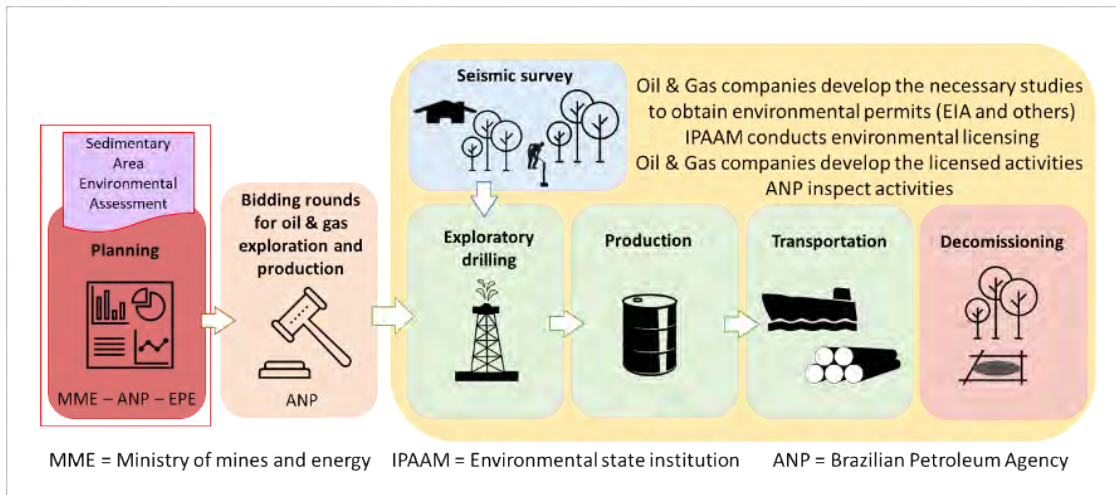


Figure 1. Schematic flow of Solimões basin Oil & Gas activities, showing institutional responsibilities.

3. Risk of oil spills from exploration or production is very low at Solimões sedimentary basin

In the Solimões sedimentary basin, oil production has been declining (green line) and natural gas production has been rising (red line) (Figure 2). Based on resource potential, Solimões Sedimentary Area Environmental Assessment's forecasted scenarios expect mainly natural gas production for the next 20 years.

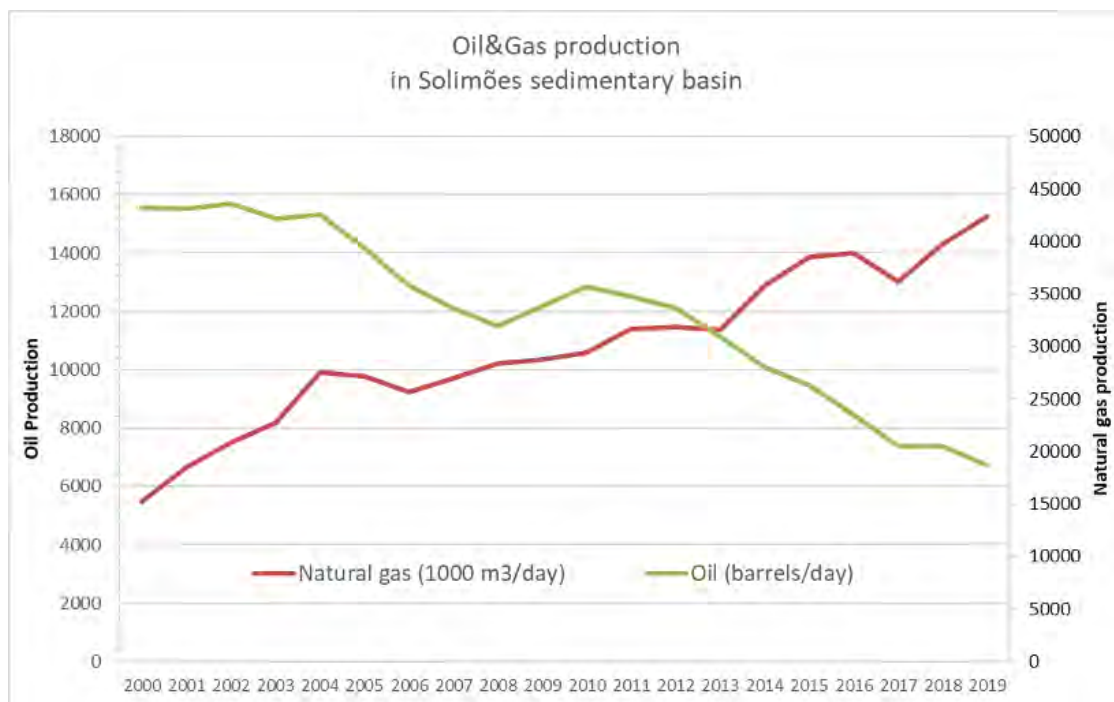


Figure 2. Oil & gas production since the year 2000 in the Solimões sedimentary basin. Data source: www.anp.gov.br – Access March 18th 2020.

The author's commentary mentioned oil spills associated with oil & gas fields in Peruvian and Equatorian Amazon. Regarding the available information about these oil spills, they originated on pipelines accidents and not on the drilling or production

wells themselves. Besides that, the institutional and regulatory frameworks in those countries are different from Brazil.

In the Solimões sedimentary basin, the oil is transferred from the production field to a waterway terminal through the 279-km long Urucu-Coari pipeline and then is carried by tankers to the oil refinery in Manaus. Every onshore pipeline in Brazil follows technical and safety specifications established and inspected by the Brazilian Petroleum Agency (ANP – www.anp.gov.br – Resolution n. 6, Feb 2nd 2011).

Therefore, large oil spills are not expected to be a significant risk in the Solimões basin, since oil production is declining and there are regulatory measures to prevent and address accidents.

4. Indigenous and traditional peoples

When the author mentions “*The first blocks made available to oil and gas firms in February 2020 excluded those blocks that might contain isolated indigenous peoples, which displeased the companies*”, he is referring to the Amazonas sedimentary basin, which is alongside the Solimões sedimentary basin, as shown on the following figure.

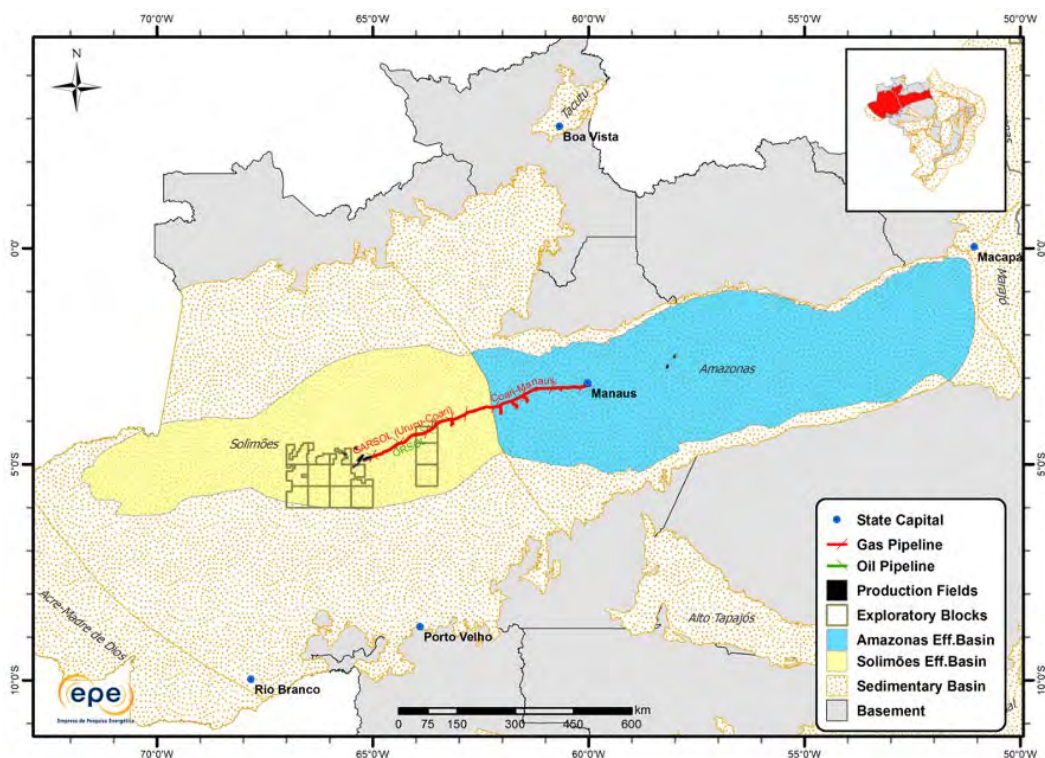


Figure 3. Solimões and Amazonas sedimentary basins, with the effective potential differentiated (effective basins). The red line represents the large Urucu-Coari-Manaus pipeline.

Since that on both sedimentary basins the presence of indigenous and traditional peoples is a key characteristic, this subject was carefully treated on Solimões study. EAAS Solimões included a participatory process composed by six phases, two of them dedicated exclusively to indigenous and traditional peoples, who also

participated in the other four phases, when they had special attention, due to their right to a communication adapted to their differentiated way of life.

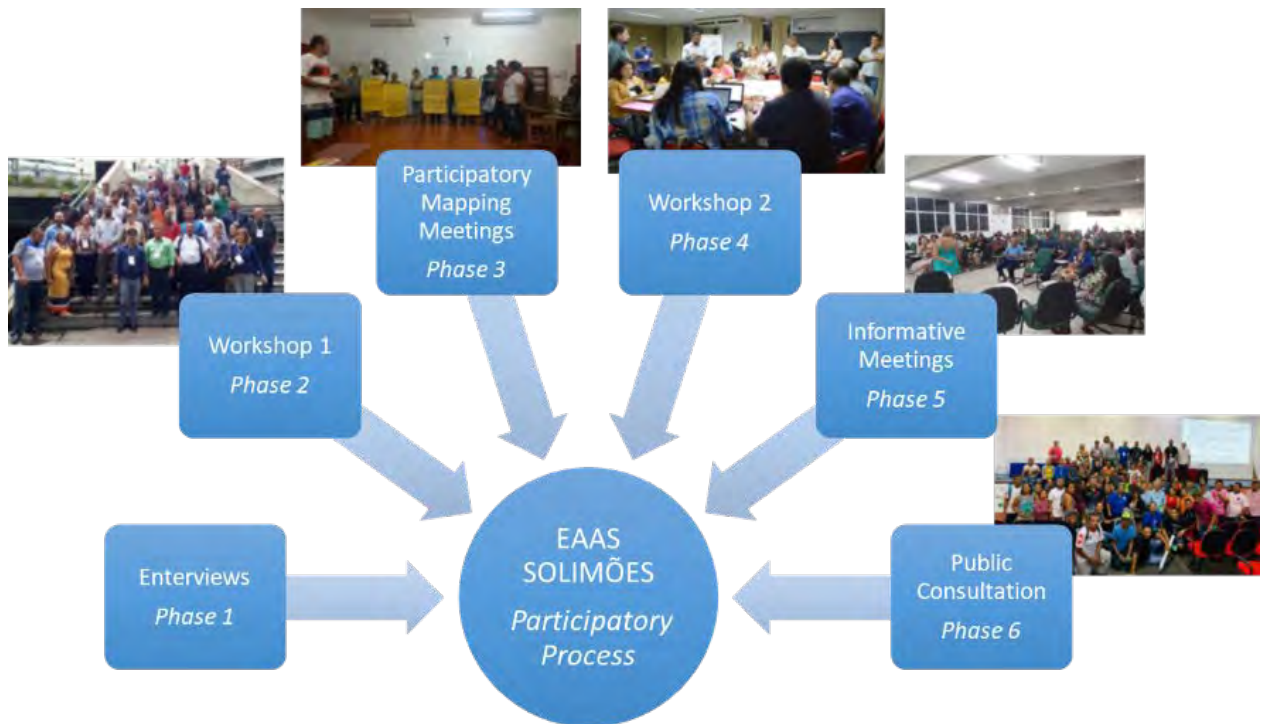


Figure 4. Solimões study participatory process, in six phases (photos had their resolution proposedly lowered, to preserve attendee's identities).

This whole participatory process was designed to promote participation and dialogue, and the main results were the identification of indigenous lands still not officially recognized, and demand for public policies on the region.

The information gathered through the interaction with local communities was added to secondary data obtained in the literature and analyzed to establish indicators of inaptitude, i. e., social and environmental phenomena considered incompatible with oil & gas exploration and production. The indicators are present in areas that should be avoided by oil & gas future activities (Figure 5): Indigenous lands (both officially recognized and those not recognized yet – A), Conservation Areas (B), Lakes and Flooded forests (C).

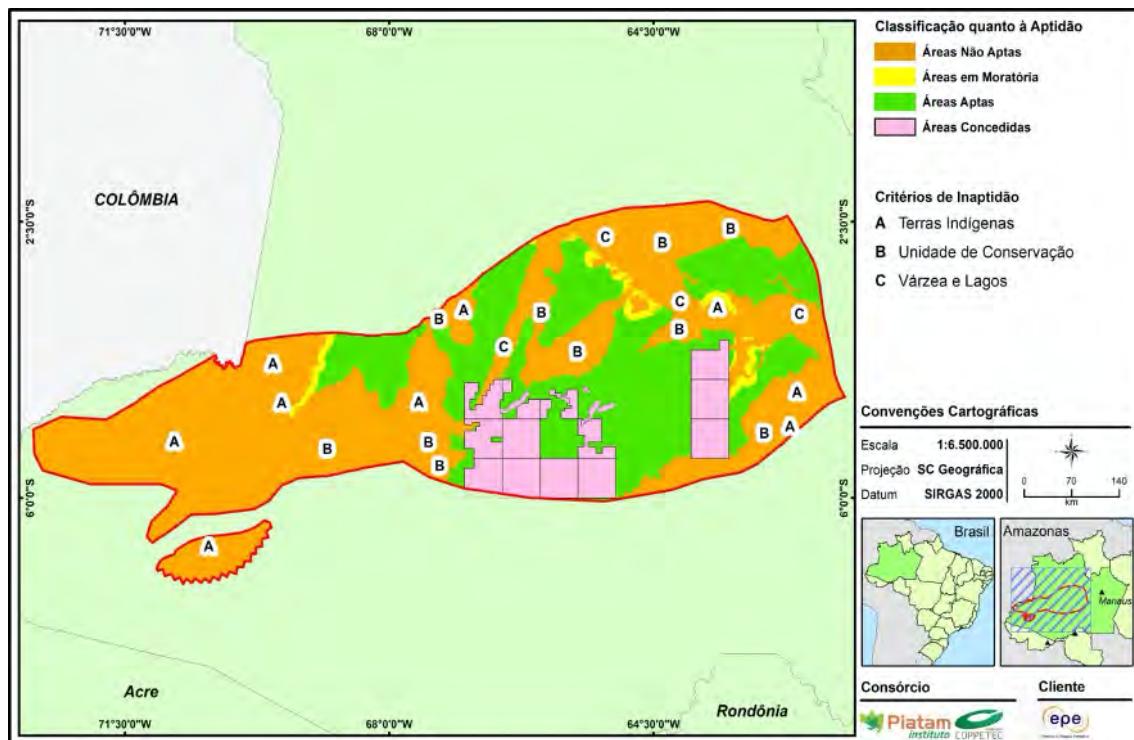


Figure 5. Classification of aptitude (In orange, not suitable areas, and in yellow, moratorium. In green, suitable areas, where new activities still need to be submitted to the environmental licensing process, as explained in item 1, above. In pink, areas already with concession contracts between oil & gas companies and the Brazilian government – the area that is actually explored is much smaller, see Figure 7). The area subjected to the classification of aptitude is delimited by the red line (“Effective basin” – where the main oil & gas potential is located).

5. Oil & gas activities growth is not expected to promote intense deforestation in the next 20 years

It is possible to observe that deforestation is mostly associated to the urban areas of the main cities, which is a result of the lack of public investments in rural areas through time and of people migrating from rural to urban areas in search for opportunities and better living conditions (Figure 6).

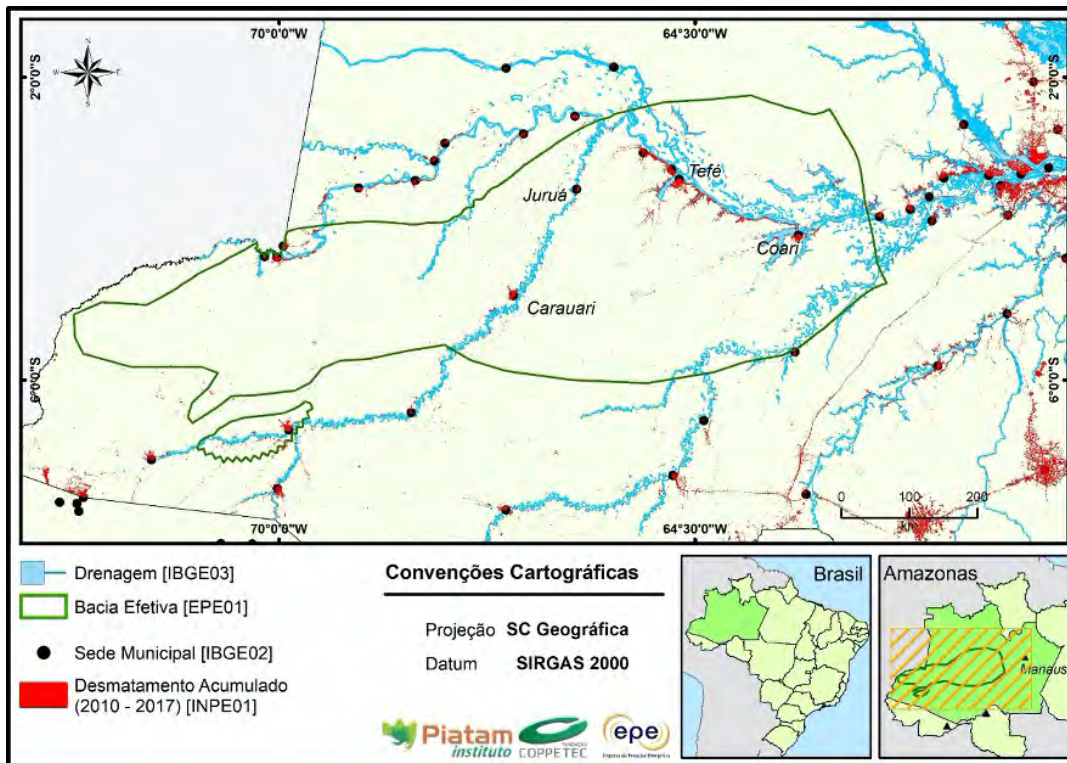


Figure 6. Accumulated deforestation between 2010 and 2017 in the Solimões sedimentary basin [Based on National Institute for Space Research – Accumulate Deforestation (2010 – 2017 – <http://www.dpi.inpe.br/prodesdigital/prodes.php>, Access: jan 2019)]. Green line shows the “Effective basin” – where the main oil & gas potential is located.

The main concern in the author’s commentary relies on the hypothesis that oil & gas companies will open roads to transport their production and, as a consequence, promote a high increase in deforestation. Nevertheless, it is not observed in practice. The ongoing activities adopt the offshore model, in which the production processing is centralized, and equipment, inputs and workforce movement are done without roads, through the air or navigable rivers. In addition, the long Urucu-Coari-Manaus gas pipeline had a very hard and expensive constructive process, crossing high forests, flooded soils and wide rivers. A large road would require even higher costs, which might include constant maintenance due to frequent and heavy rains on the region. Oil & Gas companies are aware of such difficulties and tend to concentrate efforts and investments where it is more prone to install infrastructure, i. e., near the Urucu-Coari pipeline or close to a navigable river.

The author states that “*when drilling expands to hundreds of locations the financial viability of roads would increase dramatically*”. However, even Solimões study’s high-increase-in-activity hypothetical scenario for the next 20 years foresees only six more new production fields, being four on areas already with concession contracts. Each production field is a cluster of several production wells connected to a production base, where the oil or gas is pre-processed and get ready to be transported. Even if hundreds of well locations are open in Solimões basin, they will not be simultaneous (see oil & gas activities, item 2). Also, it is neither technically nor financially viable to transport oil or gas directly from each production well.

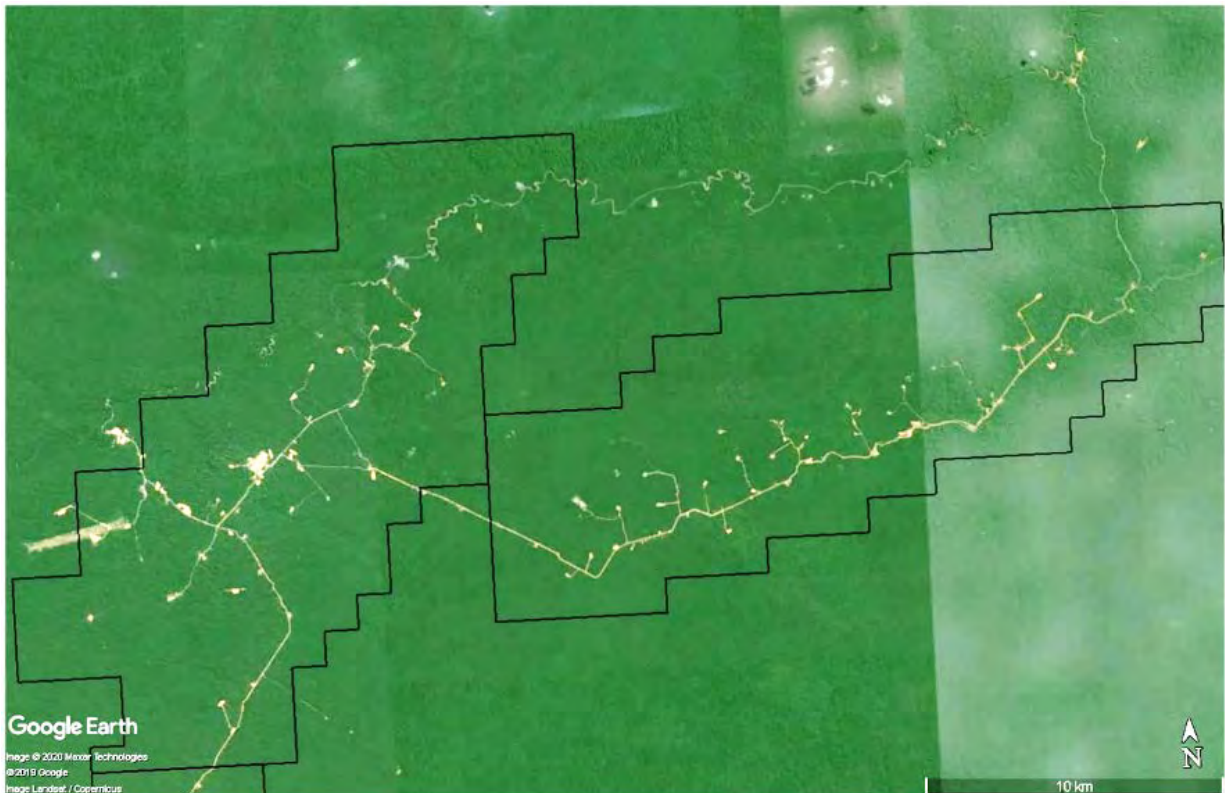


Figure 7. Satellite image of two Petrobras production fields (Urucu and Leste Urucu). Oil & gas production in the Solimões sedimentary basin causes little deforestation since 1980's, when Petrobras started producing on those production fields (In black, delimitation of production fields; In green, forest; clear dots are drilling sites clearings; and clear lines are linking roads/pipelines. These local roads do not connect to main roads outside the fields and are not deforestation vectors).

Finally, the Solimões study has a long history of development, first with the Ordinance 198/2012, published by Ministries of Mines and Energy and of Environment, after that the public bidding and hiring, in May 2018, of university researchers to develop the study. Over the years, the whole process was oriented and supervised by a Monitoring Technical Committee, composed by institutions associated with either the Ministry of Mines and Energy and the Ministry of Environment. It is important to stress that EPE and the other government institutions involved in Solimões Sedimentary Area Environmental Assessment are constantly concerned with social and environmental impacts associated with O&G activities and how to prevent and mitigate them.

Solimões study is open for public comment until April 3rd 2020

(<http://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/estudo-ambiental-de-area-sedimentar-do-solimoes>).

The danger of Brazil's Amazon plans for oil and gas: Response to EPE (commentary)

By Philip M. Fearnside

It is opportune to respond to the comment entitled “Oil & gas environmental strategic study as a tool for conflict mitigation in the Amazon,” sent to Mongabay by the Brazilian government’s Energy Research Company (EPE) [above]. EPE’s comment on my text of 9 March 2020 “[Oil and gas project threatens the last large block of forest in the Amazon](#)” [1] claims that my text “may harm the critical knowledge of the society about the study.” EPE’s comment is revealing precisely in view of the environmental and social threats that I raised in my text.

I referred to the EAAS Solimões document (Environmental Study of the Solimões Sedimentary Area) [2] as a kind of “preliminary Environmental Impact Assessment (EIA),” which describes its function in practice. The EPE commentary explains that the EAAS Solimões “resembles” a Strategic Environmental Assessment (SEA) and that it is not an EIA. I believe that, in essence, the EAAS Solimões serves as a “trial balloon” to see what criticisms will arise and prepare the authors of the EIA to counter them. EPE’s commentary describes the objective of a SEA as “reducing conflicts that could appear only in EIA,” in other words, increasing the acceptance of the oil and gas project to ensure approval of the environmental licenses. The description of the EAAS Solimões in the title of the EPE commentary as a “tool for conflict mitigation in the Amazon” would be an allusion to facilitating this approval by avoiding “harm” from inconvenient information.

EPE has a great responsibility because it has the function of thinking and suggesting the most sensible development paths for the country in its area of operation, in this case, energy. This is fundamentally different from executing agencies that follow orders to implement a given public policy or infrastructure project. EPE’s comment dodges this responsibility, emphasizing that the EAAS Solimões is not an EIA and implying that it is the EIA, which will come later, that will serve as a shield to protect the environment from any impact. EPE emphasizes that the EAAS Solimões “is not a project and it *does not implant wells*.” While it is clear that this stage has not yet been reached, the EAAS Solimões is part of the bureaucratic process that leads precisely to these future actions and their associated impacts.

EPE’s commentary says that the EAAS Solimões carried out a “scenarios analysis” taking into account the “region’s social and economic tendencies” and the “region’s oil and gas attractiveness.” The problem is that these scenarios do not include the region’s attractiveness to sectors other than oil and gas, including land grabbers (*grileiros*) [3], organized landless farmers (*sem terras*) [4], ranchers [5], loggers (including Chinese and Malaysians) [6] and Malaysian companies interested in planting oil palm [7]. The “social and economic tendencies” of an isolated region with a population of traditional riverside residents (*ribeirinhos*) are totally different from the tendencies on a frontier that is open to the entry of external actors like these.

The spatial extent of future oil and gas exploitation is minimized in the EPE comment, emphasizing that the green lines on the map reproduced in my text are only sites for prospecting already carried out by seismic techniques, and not (yet) for drilling exploratory wells. But the map demonstrates precisely the enormous extent of the initiative, a fact that is not altered by the plan to drill wells only in the most promising locations along the green lines indicated on the map.

EPE's comment minimizes the danger of oil spills, implying that spills in Peru and Ecuador are not relevant because the "institutional and regulatory frameworks in those countries is different from Brazil." However, the "institutional and regulatory frameworks" in Brazil do not offer much guarantee against accidents, as was made clear by the disasters in Mariana [8] and Brumadinho [9]. In addition, the current Brazilian presidential administration has carried out a significant dismantling of its regulatory and supervisory agencies [10, 11].

With regard to indigenous and traditional peoples, the fact that the area where oil and gas companies are seeking permission to drill in the territories of isolated peoples is located adjacent to the "effective basin" treated in the EAAS Solimões document does not alter the gravity of the situation. Companies interested in the Solimões "effective basin" that is the subject of the document include Rosneft, a Russian state enterprise that is the subject of a very long series of accusations, including a report by Greenpeace Russia in 2018 that indicates the company as responsible for more than 10,000 oil spills a year in the world (see [12]). Companies such as Rosneft are not likely to respect indigenous rights more than the absolute minimum effectively demanded by the Brazilian government. Nor is it likely that the government would enforce the guarantees contained in Brazilian legislation, as demonstrated by the current lack of consultation with indigenous peoples impacted by Highway BR-319 [13]. The current Brazilian presidential is committed to an openly declared effort to reduce the protection of indigenous peoples [14, 15] and to open indigenous areas to the entry of various types of exploitation, including oil and gas [16, 17].

In the section of EPE's comment headed "Oil and gas activities not expected to promote intense deforestation in the next 20 years," EPE argues that I based my argument "on the hypothesis that oil and gas companies will open roads to transport their production and, as a consequence, promote a high increase in deforestation in the region," and that this would be economically unfeasible for companies and, therefore, would not happen. However, my text does not claim that the oil and gas companies themselves would build the roads, nor does it claim that the use of the roads would be to transport the companies' "production" of oil and gas. The roads are more likely to be built by the government, although the government would likely be responding to a lobby that would include the oil and gas companies. The advantage for the companies would be to make it cheaper to transport the material and personnel that today is done by expensive air transportation under a "platform model," as if the groups of wells were oil platforms at sea. If roads are built, the oil and gas companies would not be likely to "promote" deforestation, even after the short 20-year time horizon during which the section heading affirms that the oil and

gas activities will not lead to “intense deforestation.” Deforestation would be done by other actors that are not part of the scenarios imagined in the EAAS Solimões.

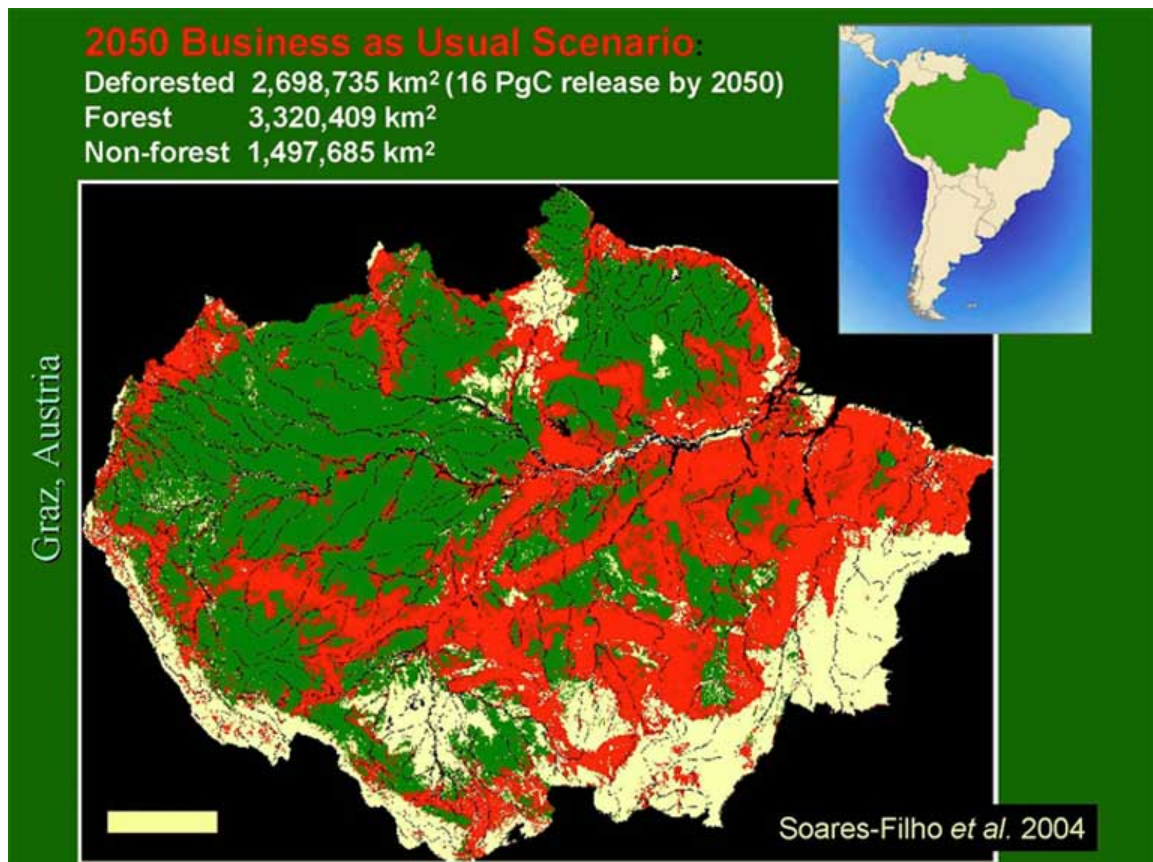


Figure 3. Simulation of deforestation by 2050 by Britaldo Soares-Filho and colleagues, published in *Nature* in 2006. The vast green area in the western part of the Amazon basin remains intact in the simulation because planned roads opening this area are not included. The oil and gas project now adds an additional risk. Image courtesy of Soares-Filho et al, 2004.

It is notable that EPE’s commentary does not contain any mention of the explanation in my text of the serious impacts in a scenario with the opening of roads and consequent deforestation. The area in question is the last large block of intact Amazon rainforest, and it is essential for environmental services that include maintaining the rainfall regime in parts of Brazil outside the Amazon, including water supply for the city of São Paulo and the generation of hydroelectric power in the Paraná and São Francisco river basins [18]. Maintaining the generation capacity of the country’s existing hydroelectric plants is one of EPE’s direct attributions. Certainly, there is no higher priority for those planning the future directions of development in Brazil than taking all precautions to keep this particular block of forest intact. EPE, as an agency that shares the responsibility for guiding development in Brazil, would be negligent if it does not consider the consequences of facilitating an oil and gas project that implies risks of this magnitude.

EPE concludes by pointing out that the EAAS Solimões is open for public consultation until April 3rd. Before the original March 19th deadline, I submitted a note through the official consultation website warning of the need to ensure that

roads are not built. I also raised this concern orally during the initial presentation of the EAAS Solimões that was held at the Holiday Inn in Manaus. Of course, the mere statement in the EAAS Solimões document that roads would not be built does not guarantee that this will not happen. My conclusion that the danger of opening the area for entry of deforesters is not being considered in the plans is now further reinforced by the comment sent to Mongabay by EPE.

Notes

- [1]. Fearnside, P.M. 2020. Oil and gas project threatens Brazil's last great block of Amazon forest (commentary). *Mongabay*, 9 March 2020. <https://news.mongabay.com/2020/03/oil-and-gas-project-threatens-brazils-last-great-block-of-amazon-forest-commentary/>
- [2]. Consórcio PIATAM/COPPETEC & EPE. 2019. *Estudo Ambiental de Área Sedimentar na Bacia Terrestre do Solimões: EAAS Preliminar Relatório Técnico destinado à Consulta Pública*. Consórcio PIATAM/COPPETEC, Manaus, AM & Empresa de Pesquisa Energética (EPE), Rio de Janeiro, RJ, Brazil. 497 pp. <http://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/estudoambiental-de-area-sedimentar-do-solimoes>
- [3]. Fearnside, P.M. 2008. The roles and movements of actors in the deforestation of Brazilian Amazonia. *Ecology and Society* 13(1): art. 23. <http://www.ecologyandsociety.org/vol13/iss1/art23/>
- [4]. Fearnside, P.M. 2001. Land-tenure issues as factors in environmental destruction in Brazilian Amazonia: The case of southern Pará. *World Development* 29(8): 1361-1372. [https://doi.org/10.1016/S0305-750X\(01\)00039-0](https://doi.org/10.1016/S0305-750X(01)00039-0)
- [5]. McAlpine, C.A., A. Etter, P.M. Fearnside, L. Seabrook & W.F. Laurance. 2009. Increasing world consumption of beef as a driver of regional and global change: A call for policy action based on evidence from Queensland (Australia), Colombia and Brazil. *Global Environmental Change* 19: 21-33. <https://doi.org/10.1016/j.gloenvcha.2008.10.008>
- [6]. Luis, E. 1997. Embaixador da Malásia depõe sobre madeireiras asiáticas. *Amazonas em Tempo*, 26 June 1997.
- [7]. *Amazonas em Tempo*. 2008. Malaios querem terras do Amazonas. 22 August 2008.
- [8]. Fernandes, G.W., F.F. Goulart, B.D. Ranieri, M.S. Coelho, K. Dales, N. Boesche, M. Bustamante, F.A. Carvalho, D.C. Carvalho, R. Dirzo, S. Fernandes, P.M. Galetti Jr., V.E.G. Millan, C. Mielke, J.L. Ramirez, A. Neves, C. Rogass, S.P. Ribeiro, A. Scariot & B. Soares-Filho. 2016. Deep into the mud: ecological and socio-economic impacts of the dam breach in Mariana, Brazil. *Natureza & Conservação* 14: 35-45. <https://doi.org/10.1016/j.ncon.2016.10.003>

- [9]. Darlington, S., J. Glanz, M. Andreoni, M. Bloch, S. Peçanha, A. Singhvi & T. Griggs. 2019. A tidal wave of mud. *The New York Times*, 9 February 2019. <https://www.nytimes.com/interactive/2019/02/09/world/americas/brazil-dam-collapse.html>
- [10]. Ferrante, L. & P.M. Fearnside. 2019. Brazil's new president and "ruralists" threaten Amazonia's environment, traditional peoples and the global climate. *Environmental Conservation* 46(4): 261-263. <https://doi.org/10.1017/S0376892919000213>
- [11]. Fearnside, P.M. 2019. Desmonte da legislação ambiental brasileira. pp. 317-381. In: J.S. Weiss (ed.) *Movimentos Socioambientais: Lutas – Avanços – Conquistas – Retrocessos – Esperanças*. Xapuri Socioambiental, Formosa, Goiás, Brazil. 442 pp. <https://doi.org/10.37682/xapbk.msoc-ed1-010>
- [12]. *Wikipedia*. 2020. Rosneft. <https://en.wikipedia.org/wiki/Rosneft>
- [13]. Ferrante, L.; M. Gomes & P.M. Fearnside. 2020. Amazonian indigenous peoples are threatened by Brazil's Highway BR-319. *Land Use Policy* 94: art. 104598. <https://doi.org/10.1016/j.landusepol.2020.104548>
- [14]. Gullino, D. & G. Shinohara. 2019. Bolsonaro diz que reservas indígenas buscam 'inviabilizar' Brasil. *O Globo*, 27 August 2019. <https://oglobo.globo.com/sociedade/bolsonaro-diz-que-reservas-indigenas-buscam-inviabilizar-brasil-23908043>
- [15]. Valente, R. 2019. Grupo do governo quer rever consulta a índios sobre grandes obras. *Folha de São Paulo*, 04 October 2019. <https://www1.folha.uol.com.br/poder/2019/10/grupo-do-governo-articula-revisao-de-consulta-a-indios-sobre-grandes-obras.shtml>.
- [16]. Ventura, M. 2020. Projeto do governo libera exploração econômica ampla em terras indígenas. *O Globo*, 11 January 2020. <https://oglobo.globo.com/brasil/projeto-do-governo-libera-exploracao-economica-ampla-em-terras-indigenas-1-24184572>
- [17]. Senado Notícias. 2020. Chega ao Congresso projeto que permite mineração em terras indígenas. <https://www12.senado.leg.br/noticias/materias/2020/02/06/chega-ao-congresso-projeto-que-permite-mineracao-em-terras-indigenas>
- [18]. Fearnside, P.M. 2015. Rios voadores e a água de São Paulo [*Amazônia Real Complete series*]. <https://doi.org/10.13140/RG.2.1.2430.1601>