

# ***OPPORTUNITIES AND CHALLENGES FOR OIL EXPLORATION ON THE AMAZON EQUATORIAL MARGIN***

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## **Overview**

The context of intensified exploration for new reserves in Brazil, in view of the expected maturation of the pre-salt fields, sets precedents for the risk of energy insecurity. The Brazilian Equatorial Margin region, especially its Amazonian portion, plays an important role in this scenario, due to the discovery of large volumes of oil and gas in Guyana, Suriname and French Guiana, which is around 50 km from the Amapá border. This has motivated oil and gas companies to start their exploration activities in the region. However, the Foz do Amazonas Basin, the closest to the Guyana-Suriname Basin, is in an environmentally, socially, and economically sensitive region. This makes the need to map as many of the impacts associated with the project as possible, and to identify measures to mitigate negative impacts, even more relevant. This research therefore identifies the opportunities, the possible negative impacts of oil and gas exploration in the region, and the alternatives for mitigating them.

## **Methods**

To identify the possibilities and the socio-economic and environmental impacts that generally occur in the vicinity of oil and gas developments, a bibliographical survey was carried out by searching national and international databases in offshore oil exploration. By analyzing the contexts of 30 papers and observing the specificities of the Amazon region, a set of measures was drawn up that could contribute to responsible offshore exploration. To characterize the affected population, information was collected on its quantitative representation by municipality, as well as its occupancy rate per km<sup>2</sup>.

This information is important for understanding whether there is overpopulation in the region, a characteristic that would whether the needs of the population exceed or threaten the carrying capacity of the environment, considering, for example, the availability of natural resources. In addition, information was collected on the quantitative disposition of these populations by age group, to understand the age vulnerabilities of the different groups.

## **Results**

The socio-economic survey showed that the coastal population adjacent to the has a history of mineral exploitation and social characteristics that reveal the population's high vulnerability of the population to large undertakings. In addition, there is a need to observe the impacts that offshore exploration activity can have on communities that are highly dependent on fishing, to avoid a reduction in the catch of species, the disappearance of dozens of fishing production cooperatives and the marginalization of the sector.

One suggestion for dealing with these impacts is to anticipate scenarios, which can be carried out jointly by the company and the state. This consists of carrying out pre-installation studies on the project's socio-economic components, with a view to reducing potential conflicts between the energy sector and artisanal fishing, making it possible for the two to coexist.

Furthermore, as part of the collaboration between the state and the company, there is the possibility of an educational mapping of the local population to direct them towards the demands of oil activities, allowing regional players to enter the growing job market. It is also possible to carry out a quantitative assessment of the expectation and period for future job losses, allowing for the planning of the reallocation of professionals with a lower technical level to other fronts of activity in the region (apart from fishing), encouraged by the investments coming from oil exploration.

This can happen at the same time as a survey to project population growth, strengthening measures for urban planning, diversification of forms of employment and control of the population boom - derived from professional foreignness in the Amazon. As for the environmental repercussions related to the stages of prospecting and operating platforms, it is worth highlighting the indispensability of environmental licensing - a procedure that will guarantee the development of appropriate safeguards for the Foz do Amazonas Basin, to reduce environmental risks to a minimum. This is because its execution for the area in question, delegated to IBAMA by Complementary Law 140/2011, requires the production of an extensive Environmental Impact Study (EIS), considering the intensive nature of the activities.

Safe exploitation of the Amazon Equatorial Margin is conditional on compliance with this series of requirements, which will be analyzed during the three-phase licensing process and afterwards, in future inspections. In this context, it is worth mentioning a device that is still absent for the Foz do Amazonas Basin and is of vital importance for related projects: the Environmental Assessment of Sedimentary Areas (AAAS). This type of strategic environmental assessment (in this case, a federal responsibility) complements the EIA and is required by IBAMA, given the need for a greater volume of data to understand the exploration process. In other words, there is still a significant regulatory margin for strengthening safeguards for the Amazon.

The technical frontiers for mitigating emissions during E&P activities are related to the implementation of CO<sub>2</sub> management technologies, especially Carbon Capture and Storage (CCS). The introduction of this type of arrangement - with the capture, compression, and transport of CO<sub>2</sub> for storage in a geological formation isolated from the atmosphere - has been consolidated as the main decarbonization front for the oil and gas industry, especially in Brazil.

With Petrobras' current infrastructure for injecting CO<sub>2</sub> into pre-salt reservoirs (for advanced oil recovery), as well as the prospects for developing a capture and storage hub in depleted reservoirs in the complex, a similar scenario can be projected for the company's possible activities in the Amazonian offshore environment. In this way, reaffirming its commitment to the energy transition, Brazilian oil would continue to be linked to low-carbon operations.

## **Conclusions**

Exploration would be attractive if the socio-economic and environmental safeguards listed were implemented and strengthened, aligning the interests of the enterprise with the demands of the local population and governments. The Amazon (be it its population or environment) requires technical treatment that considers its specificities compared to other regions of the country, especially as it is a region that has historically been sensitized by intensive economic cycles - which is why it is important to carry out an in-depth survey of the pros and cons.

Still considering this sensitivity, it is interesting to consider the benefits for regional development that this type of activity could bring. From an economic point of view, it is worth questioning whether the transfer of royalties could positively change the current situation. How much local human resources would be used, to the detriment of professionals moving from other parts of the country. And whether there would be a return of capital to the regional economy, allowing it to diversify.

Finally, the importance of the Equatorial Margin for the Brazilian energy sector should be highlighted. The oil from the Foz do Amazonas Basin would not only guarantee the replenishment of national reserves but would also provide an increase in regional energy security (if it is associated with low carbon operations) by integrating with other existing O&G activities and investments in the transition to lower emission sources.