

# Amazonian Wood Traceability by Nuclear Analytical Techniques

Otávio Gabriel Pontes Vieira and Paulo Sérgio Cardoso da Silva

*Instituto de Pesquisas Energéticas e Nucleares (IPEN), São Paulo, Brazil*

[otavio.gabriel2001@usp.br](mailto:otavio.gabriel2001@usp.br) : Otávio G.P. Vieira

[pscslva@ipen.br](mailto:pscsilva@ipen.br) : Paulo S. C. da Silva

The illegal deforestation is a problem around many parts of the world, and it represents a great threat to the global biodiversity. In Brazil, no other region is more affected by this practice than the Amazon Rainforest. Recently, in 2022, the *Instituto do Homem e Meio Ambiente da Amazônia* (Imazon) published that between January and December of that year an alarming 10 573 km<sup>2</sup> of forest were illegally cut down, the highest deforestation rate in fifteen years. This illegal wood then enters the market and impacts not only the national economy but also the responsible wood industries because there is no clear distinction between legal and illegal wood during the commercialization. In light of this problem, this project proposes the use of nuclear analytical techniques to investigate the traceability of amazonian wood. The concept of traceability can be defined as the act of identifying the history or origin of a certain product, and, for example, it is very common in the food industry. When talking about wood the main belief is that the log incorporates the chemical elements of it's surroundings (soil and atmosphere), so it would be possible to establish a correlation between the wood and it's place of origin. Finally, once the correlation is established, it would be possible, in theory, to determine if the wood came from a legal site or illegal one, becoming another weapon to be used to fight this problem. This project will use techniques such as Instrumental Neutronic Activation Analysis and Gamma Ray Spectroscopic to investigate and determine the wood composition, and a ray of statistical analysis to establish a correlation between different types of wood that were collected in the same areas/regions. The experiments are being conducted using IPEN's nuclear reactor (IEA-01) and detectors, while samples were catalogued and sent by *Instituto Nacional de Pesquisas da Amazônia* (INPA).