



INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

"KEY ELEMENTS FOR A SUSTAINABLE WORLD: ENERGY, WATER AND CLIMATE CHANGE"

Determination of Relevant Environmental Impacts and Benefits Caused by Balbina Hydropower at Amazon

D. Wittmann ^a, S. H. Bonilla ^b

a. Universidade Paulista, São Paulo, dwit@terra.com.br

b. Universidade Paulista, São Paulo, bonilla@unip.br

Abstract

While Brazil exploits less than 30% of its hydrological potential to generate electricity, the hydroelectric generation system operates near the limit of capacity. In parallel, more than 10 projects, totaling approximately 2,500 MW (megawatts), are hampered, some of them about from 20 years, without generating electricity, due to environmental issues. There is uncertainty in terms of new investments, and controversy about the losses and environmental benefits, this the central point. This study engages in determining relevant environmental impacts and benefits beyond the generation itself, using the methodology of accounting emergy (Odum, 1996), which based on the ecology, thermodynamics and systems analysis, is able to assemble in a common unit (joules of solar energy), values both physical, as social and economic. For both is studied the hydropower Balbina, in the Amazon, selected, first by being considered the worst Brazilian example in terms of environmental performance, second because the northern region of Brazil is that most shows potential to be exploited. This paper presents that Balbina shows favorable environmental sustainability. There are apparent signs, but left doubts about the beneficial role socio-economic. The most representative environmental damage is represented by the emission of gases causing the greenhouse effect, CO₂ (carbon dioxide) and CH₄ (methane), mainly due to the extensive and shallow flooded area, and their inappropriate preparation for flooding, in combination with the natural and complex climatic condition of the Amazon.

Keywords: Production of hydroelectric power; Emergy; Environmental sustainability; Balbina hydropower; Amazon.
