ID de Contribution: **124**   Type: **Contributed talk**

INTERMODAL SERVICE ASSESSMENT USING THE MARKOV DECISION PROCESS: A CASE STUDY OF BRAZIL'S FERROGRAO RAILROAD PROJECT

jeudi 31 juillet 2025 11:15 (30 minutes)

Decision support models are essential for assessing logistics infrastructure projects, such as intermodal terminals. This study proposes a methodology to analyze the multiple impacts of strategic decisions on terminal location in conjunction with the tactical problem of designing an intermodal service. The case study of Mato Grosso's soybean export logistics network was structured as a Markov Decision Process (MDP) and resolved through a backward induction algorithm, which solves the single-source shortest-path problem. The application of the proposed methodology, called ISA-MDP, to the upcoming EF-170 ("Ferrogrão") railroad project has identified the economic, social, and environmental impacts of constructing a new railway and intermodal terminal on the contestable and captive hinterlands of each logistics export corridor. Due to changes in hinterlands and the cargo attraction potential of the new terminal, resulting in shifts in transportation traffic flow, logistics costs are estimated to reduce by up to $16 per ton, while greenhouse gas emissions are expected to decrease by approximately 35% through shifts in transportation modes. However, since the project is situated within the Amazon and Cerrado biomes, the potential benefits must be contrasted to land use changes driven by anthropic activities. These include the occupation of indigenous territories, direct deforestation caused by the railroad installation, and indirect deforestation caused by soybean croplands expansion process towards conservation areas. This process aggravates the effects of climate change, which are not adequately addressed in the project's Environmental Impact Assessment (EIA).

Author: M. BENEVIDES VELOSO, Ronaldo (USP)

Co-auteurs: Dr DE OLIVEIRA MOTA, Daniel (USP); LEAL GOMES LEITE, João Marcelo (Universidade de São Paulo (USP)); Dr NOVAES MATHIAS, Tiago (Kyushu University)

Orateur: LEAL GOMES LEITE, João Marcelo (Universidade de São Paulo (USP))

Classification de Session: Application in energy, finance or logistics

Classification de thématique: Applications in energy, finance or logistics