

## **MIRA Model: a new tool to guide public procurement policy towards sustainable development**

Topic: Input-Output Analysis: Sustainable Production and Consumption policies (13)

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In recent decades, the understanding of public procurement has evolved significantly, shifting from a mere administrative tool for the acquisition of goods and services into a strategic instrument for integrating policies and promoting broad social, environmental, and economic objectives. In a developing country like Brazil, which faces strict fiscal rules, slowing growth, extreme climate events, and international supply chain risks, using this purchasing power strategically is imperative. Brazilian legislation and international agreements mandate the promotion of sustainable production and consumption patterns. The new bidding and administrative contracts law (Law 14.133/21) notably emphasizes sustainable national development, life-cycle product assessments, social responsibility, productive inclusion, and sustainable technological innovation. Despite this favorable legal framework, the operationalization of sustainable public procurement faces practical hurdles. Historically, Brazilian public contracting has been driven by an efficiency paradigm focused almost exclusively on obtaining the lowest price and minimizing risks. Besides that, it is profoundly difficult for decision-makers to discern which specific acquisitions effectively serve a public policy while simultaneously promoting sustainable national development. To address this gap, the Brazilian Ministry of Management and Innovation in Public Services (MGI) is developing the Regionalized Model of Socioeconomic and Environmental Impact (MIRA). MIRA is designed as a decision-support tool to evaluate how the government can strategically direct its procurement to foster sustainability and what the multi-sectoral impacts of implementing productive sovereignty and sustainability requirements will be on the broader economy and the environment.

MIRA is an economic model that combines traditional Input-Output (IO) analysis with macroeconomic Stock-Flow Consistent (SFC) evaluations. This integration allows for the simulation of impacts resulting from the interactions between standard macroeconomic variables and socio-environmental variables, including employment, income distribution, technical progress, energy use, and environmental degradation.

Specifically, the methodology entails a detailed sectoral analysis of greenhouse gas (GHG) emissions directly associated with public contracting, taking into account both emission intensity and participation in the Gross Domestic Product to identify the most promising supply chains for targeted policy interventions and an evaluation of strategic production chains to productive sovereignty. The core of the study features a simulation that compares a "Business as Usual" (BAU) baseline scenario—relying on current vectors of government consumption and public investment—against alternative scenarios. These alternative scenarios test specific policy interventions currently under debate regarding sustainability and productive sovereignty requirements, evaluating their mid-to-long-term effects on economic growth, the density of productive chains, job creation, and GHG emissions.

The empirical application is built upon a comprehensive dataset that is harmonized with the methodology of Brazil's national accounts. The foundational data includes a series of Input-Output Matrices (MIP) (Passoni and Freitas, 2022) and Investment Absorption Matrices (MAI) developed within MIRA Project. The model utilizes vectors of greenhouse gas emissions specifically developed for the project, disaggregated across 67 distinct economic activities. This is complemented by official Brazilian employment data covering the period from 2010 to 2019, as well as highly disaggregated, recent public procurement data extracted directly from the official purchasing systems managed by the MGI.

The complete scope envisions continuous evolution, incorporating in future works, regional input-output and investment absorption matrices, detailed government consumption data, water and

energy usage metrics, and a comprehensive Social Accounting Matrix.

The primary novelty of this research lies in the development and application of a macroeconomic multi-sectoral model strictly calibrated to the Brazilian reality. This research presents the first simulation produced by MIRA designed specifically to support decision-making, prioritize interventions, and justify the implementation of sustainability and sovereignty requirements in the public procurement of the Brazilian federal executive branch. By bridging complex Input-Output economics with real-world, highly granular public purchasing data, the study offers an unprecedented tool for policymakers. It enables governments to quantitatively weigh the systemic effects of alternative procurement policies, thereby ensuring that the state leads by example, legitimizes sustainable practices through its demand, and actively molds markets toward resilience and sustainability.