

Optimization model as a decision support system for participating in public tenders for feeding programs

HÉLIO FUCHIGAMI (1) MAICO RORIS SEVERINO (1) ATHANASIOS RENTIZELAS (2) ANDREA TUNI (2) LIE YAMANAKA (1)

(1) FEDERAL UNIVERSITY OF GOIAS (2) UNIVERSITY OF STRATHCLYDE

Communities of small family farmers are among the poorest and most vulnerable segments of Brazilian society, so any increase in their disposable income would make a significant difference in their living standards. In response to this social problem, Brazilian authorities have developed programs to encourage family farming (such as the PAA - Food Acquisition Program and the PNAE - National School Feeding Program, in English), giving family farmers priority to the provision of agricultural products and food to schools and public institutions. However, farmers face a challenge both in deciding which public calls they subscribe to and in distributing their products to schools and public institutions. They struggle also in identifying which areas and contracts to compete for, leading to reduced participation of vulnerable farmers in government programs specifically designed to support them. To this end, a decision support system (DSS) based on an optimization model was developed to address this problem. The DSS allows farmers to identify which bids to attend based on a two-phase-gate process, which evaluates bids based on their individual profitability as well as on a geographical area value concentration criteria.

Keywords: developing countries, optimization modelling, programming, mixed-integer

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