

Optimising the product distribution decisions for government feeding programs in developing countries

ATHANASIOS RENTIZELAS (1) MAICO RORIS SEVERINO (2) HELIO FUCHIGAMI (2) ANDREA TUNI (1)
ISOTILIA COSTA MELO (3)

(1) UNIVESITY OF STRATHCLYDE (2) FEDERAL UNIVERSITY OF GOIAS (3) UNIVERSITY OF SAO PAULO

Institutional markets have evolved as one alternative way for smallholder farmers to access the market and supply their produce at a known in advance price and quantity. This helps planning agricultural operations and provides security of income, which is critical for the farmer livelihoods. One such example is the PNAE government feeding program in Brazil, where schools source raw materials and ingredients from local smallholder farmers for school meals. This work presents a Decision Support System (DSS) supporting farmers decisions on which schools to supply, with which products and how to organise the logistical activities, to maximise the net income from participation in these markets. The DSS is applied after the farmers have knowledge which bids they have been successful in, and therefore they have clarity on the potential supply areas. The decisions at this stage can be quite complex, with several factors to be considered simultaneously, such as product range, quantities and price for each school that a bid was won, distance and logistical costs, and logistical synergies when delivered quantities in the same area are larger. At the same time there are constraints such as the land, transportation and resource availability. The proposed DSS is novel in supporting smallholder farmer decisions on supplying institutional markets. The results of the DSS application for a specific smallholder farmer settlement in Brazil are presented and discussed, to assess its applicability.

Keywords: developing countries, smallholder farmers, livelihood, Decision Support System

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