Linear Multi-Objective Modelling for Comprehensive Regional Agricultural Schemes in Crete Island, Greece

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Abstract

In this study, a multi-objective single time period linear programming model for farm planning has been formulated for a typical year, to find a compromise between specific development objectives. Constraints are developed for land, labor, water, machinery' and capital. The economic aspect is addressed through the use of different production functions and the incorporation of several objectives. A real case studies was made at the Peza Cooperative in Crete (Greece). The decisions suggested by the model solution include land re-allocation, water requirements for each month, capital transfer, and employment levels in each period. The model uses data from the regions in four periods of the agricultural year. The methodological tool proposed is the ADELAIS multiple objective linear programming software. The results suggested by this system guarantee a best compromise between the conflicting objectives and show that employment stability can be reached only at the cost of business profitability, employment and level of production. However, the opportunity costs of seasonal employment in relation to added value was around 50 euros and 0.36 tons for table grape production

Keywords: ADELAIS; Constraints; Limitations; Profitability; Water Reallocation.