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Using Simulation and Linear Programming to Develop an Optimal Farm Plan for Displaced Sugarcane Farmers in Jamaica

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Abstract

After the sale of the Long Pond Sugar Factory in Clarkes Town, Trelawny in Jamaica, farmers with less than 5 acres of land found it unprofitable to grow and sell their sugarcane to the new company, mainly due to the cost involved in transporting the sugarcane to the factory and the yield that they were receiving.

The extension service of the Ministry of Agriculture has advised them to switch to the growing of cabbage, carrots and irish potatoes as there was a constant demand for these commodities by the local hotels located along the coast of Trelawny and which were much closer to them than Clarkes Town.

The results from the simulation and solving of the linear programming indicated that there was a range of Ja\$ 848,890 in the total revenue caused by a minimum revenue of Ja.\$ 748,322 and a maximum revenue of Ja. 1,597,222. The results of the simulation indicated that on the average a farmer will be guaranteed with a probability of 0.52 that their total revenue will be more than Ja.\$1.2 million. The simulation results also indicated that farmers will be guaranteed with a probability of 0.82 that their total revenue will lie between Ja\$ 0.9 million and Ja. 1.35 million.

The result of such an analysis indicates that the growing of these crops will be alternative agricultural activity that can be pursue by these farmers, most of whom have farm sizes which are less than five acres in size.

Keywords: Optimal Farm Plan, simulation, Sugarcane Jamaica