

**COMPARISON OF STOCHASTIC AND MATHEMATICAL
PROGRAMMING APPROACHES USED IN MEASURING
TECHNICAL EFFICIENCY: *ILLUSTRATED BY AN EFFICIENCY
ANALYSIS OF CATTLE FARMING SYSTEMS IN UP COUNTRY
WET ZONE OF SRI LANKA***

A PROJECT REPORT PRESENTED BY

ROSHAN NIRANJALA SERASINGHE

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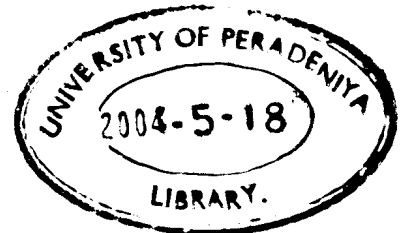
Department of Physical Science

Faculty of Applied Sciences

Rajarata University of Sri Lanka

Polgolla

Sri Lanka



During last two decades the technical efficiency measurements were developed along two competing paradigms, namely parametric stochastic frontier estimation and non-parametric data envelopment analysis. However, the consistency and compatibility of these two approaches were not investigated by any of these studies.

In this study, technical efficiency scores obtained from above two techniques are compared using production information related to cattle farming systems in Up-Country Wet Zone of Sri Lanka. Maximum likelihood estimates of the stochastic frontier were obtained and tested for returns to scale. Then these individual technical efficiencies were compared with the technical efficiency values estimated from constant returns to scale, output-oriented, data envelopment analysis.

Of two cattle farming systems studied, both the approaches revealed that integrated vegetable-based system is more efficient compared to milk-based system, in terms of milk revenue and total revenue. However, the technical efficiency scores obtained from two approaches depicted slightly different distribution patterns. It can be concluded that although the efficiency measures of two approaches are consistent, discrepancies may arise as data envelopment analysis ignores the random error.