SIMULATION MODEL FOR PADDY TRANSPORTATION STRATEGY IN SRI LANKA

by

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ABSTRACT

Cost effective paddy harvest transportation strategy is simulated in this operational study. Paddy production of administrative districts of Sri Lanka is assumed to be distributed among the districts proportional to their respective populations. Paddy production vary highly among the administrative districts of Sri Lanka and district wise consumption also varies based on population. Aim of this study is to find out the cost benefit transportation over Sri Lanka treating it as stochastic transportation problem which describe as minimize total transportation cost subject to with realized minimum probabilities of supply and demand constraint.

Transportation problem of each cultivation seasons of each year is solved by finding out the districts and amounts that need the commodity from others (called consumers) and those that can supply called suppliers. It is assumed that overall paddy production of a cultivation year is sufficient enough for total population. A transportation pattern is figure out from supplier districts to consumer districts by solving this deterministic transportation problems.

Almost all real life problems encounter uncertainty. Therefore this analysis is extended to introduce simulation model to find out optimum transportation strategy considering uncertainties. Simulated transportation strategy is presented by solving the chance constrained stochastic programming problem. The classical transportation problems for the years from 1989 to 2000 is solved here. Moreover simulated and actual results are presented for the years 2000 .

Finally this simulation model is implemented as decision support system for the cost effective transportation strategy of such products.

DEDICATION

To the memory of my Father

and to my Mother

my wife Suranji and

daughter Samadhee

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GLOSSARY

Cultivation Year. Include both Maha and Yala seasons, from September/October to August/September of the next year.

Decision Support System. An interactive, flexible and adaptable computer based information system that utilize decision rules, models and model base coupled with a comprehensive database and the decision maker's own insights.

Linear Programming Problem. A mathematical modeling technique designed to optimize the usage of limited resource

Maha Season. An agricultural season from September/October to March/April

Random Variable. A numerically valued faction defined on a sample space.

Simulation. Imitation of real world process or system over time.

Stochastic Programming Problem. Deals with situation where some or all parameters of the problem are described by random variables

Transportation Problem. A special class of the linear programming problem dealing with the situation in which a commodity is supplied from source to destination

Yala Season. An agricultural season from April/May to August/September