

A STUDY ON DECISION MAKING MODELS AND RELATED TOPICS AND ITS APPLICATIONS TO REAL LIFE PROBLEMS

R. Sophia Porchelvi¹, P. Jamuna Devi²

OBJECTIVES:

- To use the dumping yard in an optimum way and help the Nagapattinam Municipality Decision Makers through Mathematical Modeling
- To interpret Municipal solid waste by using interval transportation for minimizing the cost of transportation when the sources and demands are not known exactly
- To apply group decision making model for safe disposal of commercial fish waste.
- To minimize overall operation cost using Multi objective linear programming model in the optimization of biomass energy production from the aquatic weed Water Hyacinth.

ABSTRACT

Mathematical models for solving problems on waste management and conversion of biomass to energy have been presented in the thesis. The real life problem of decision makers in the area of solid waste management with suitable mathematical models was interpreted for finding optimized solution to the real life problems. In particular, Water Hyacinth, an aquatic weed as biomass energy production is also studied. Furthermore, various solution procedures have been developed for group decision making problems and integer programming problems and multi objective linear programming problems. Goal programming model and regression models are also used in the study. Mathematical Software packages like LINDO, TORA are also used to obtain the solutions.

SOLUTION

A careful planning is required in carrying out these activities to accomplish this in an optimal way. Transshipment model is compared with the present system followed by the Nagapattinam town and the transshipment model is found to be the best method. In the case study undertaken in Group decision making, it is concluded that re-utilization or recycling of fish waste is preferred by the group decision makers. Regression and Goal Programming model used in Water Hyacinth helps the decision makers for calculating the yield or output and also to calculate the overall cost.

CONCLUSION

This is a consolidation of a variety of Optimization models and Decision making models in a real life environment. This research work focused its attention to a study on various decision making models for solving waste management problems and conversion of biomass to energy.