

Location Routing Problem Solving: A Case Study Thailand Royal Project

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Abstract. This research presents a mathematical model to solve the location routing problem of product agriculture transportation in the royal projects in Thailand. The minimization of distance and transport costs is the objective of this work for suitable pick-up subcenter point locations in each area. The difference to amount of product in each area has an effect on the capacity ability of the product in the subcenter and transport to the main center of royal project within the conditions of time window and truck size. The suitable subcenter selection is difficulty the decision making with similar performance of each royal projects. Therefore, the mathematical model is generated to solve the decision-making problem in selecting the subcenter in pick-up and transportation. The mathematical model assumption is tested to solve the suitable subcenter point selection on the five instants in each size of problems with an exact method by Lingo V16 program. The result of testing found that, mathematical model could choose a suitable subcenter point effectively and fast in the small problem sizes within an average processing time of 5.77 minutes and increase the processing time when the increased amount of data in medium problem sizes. The average processing time is 41.35 hours for medium-sized problems. For the large problem sizes, there is unsatisfaction with the result due to the result isn't show the optimal solution and the long processing time of more than 75 hours. This result display is unsuitable for problem solving with big data for optimal solution finding. In the future, metaheuristics will be applied to algorithm design in the best solution finding to achieve faster algorithms in the future.

Keywords: location routing problem, royal project, transportation, agriculture product