Titima Wongphrawet 2013: Determination of Single Facility Location under Uncertain Supply. Master of Engineering (Industrial Engineering), Major Field: Industrial Engineering, Department of Industrial Engineering. Thesis Advisor: Associate Professor Anan Mungwattana, Ph.D. 66 pages.

This research aims at solving a single facility location problem under uncertainty for a manufacturing factory. The cause of uncertainty comes from suppliers of this factory because raw materials are agricultural products in which their yields rely heavily on the weather. Thus, building the new factory must take this uncertainty into account. The factory receives raw materials from eight different locations, then manufactures, and transports them to a port. Usually, after the raw materials are manufactured in the factory, the weight is reduced by half. The locations of suppliers for raw materials and the port are known, however, the supplies of raw materials are not known with certainty as discussed earlier. The suppliers of raw materials are approximately given by experts. In this research, the uncertainty is handled by using the concept of fuzzy number and robust optimization approach in order to determine the location of the factory. The low, median and high values of supplies for each location of raw materials are used to solve in robust approach, and the min, mode and max values are used to solve in fuzzy number approach. The rectilinear distance is assumed with the minisum objective. The goal of the research is to determine an appropriate location using robust approach in order to deal with uncertainty of supplies. The results show that although there is same decision process in robust and fuzzy number approach, solutions are different. In the robust approach, every scenario has the same probability. Then, the solution which has the minimum value from all maximize value of all scenarios is selected. For the fuzzy number approach, experts provide the probability of each scenario. The location selected is the scenario with minimum distance.

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