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IN PLANT LOCATION SELECTION. THESIS ADVISOR : ASST. PROF. CHOUJ
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This thesis presents a study on the application of the Analytic Hierarchy Process (AHP) for selecting plant location that depends on a number of factors and tradeoffs among benefits and costs. The location selection for a sorbitol factory was the study case. The criteria for plant location selection were divided into tangible and intangible factors. The tangible factors were composed of initial and annual costs. The intangible factors were composed of raw material reliability, service and facility availability, labor availability, community attitude, market advantages and land use advantages. Data were collected for five company executives through a structured questionnaire via individual interviews following the AHP approach. The potential locations were the company's plots of land in the provinces of Nakhon Ratchasima, Kalasin and Rayong. The consistency ratios found for all the decision makers' opinions were well within the acceptable limit. In making comparisons of criteria priorities with respect to their impact on the overall objective, the tangible factor had the average priority weight of 0.800 and the intangible factor 0.200. In making comparisons between subcriteria priorities with respect to the tangible factor, initial cost had the average priority weight of 0.357 and the annual cost 0.643. In making comparisons between of subcriteria priorities with respect to the intangible factor, the raw material reliability had the average priority weight of 0.396, the service and facility availability 0.294, the labor availability 0.100, the community attitude 0.064, the market advantages 0.086 and the land use advantages 0.058. The results based on comparisons of locations with respect to the various subcriteria indicated that all the decision makers' opinions were consistent. The Nakhon Ratchasima location ranked first as the appropriate location for the factory (0.513 by average composite weight), followed by Rayong location (0.303) and Kalasin (0.185).

To summarize, the application of AHP in plant location selection helps the decision makers to distinguish clearly the priority of each factor and the appropriateness of each location with respect to a factor by a procedure of making paired comparisons. In addition, AHP can check for consistency of judgements which is determined by Eigenvalue, thereby ensuring that the results truly reflect the decision makers' opinions.