FUZZY MULTI-INDEX TRANSPORTATION PROBLEMS FOR EXPORT OF COAL, CEMENT & CLINKER IN CEMENT INDUSTRIES

W.B. Vasantha Kandasamy and S. Ramathilagam

Cement industries annually export approximately thousands of lakhs of tones of cement, coal and clinker. The amount of export of these materials depends on the annual reviewed contracts estimated from the past record and experience and also depends on the amount of production in these industries and above all the mode of available transportation within their budget. For example in these recent days due to the sudden hike in railway fare even for wagons the export of coal, cement and clinker had suffered and also the already approved cost and cost raise due to the hike in the transportation charges cannot be easily compensated.
Because of these unpredictable situations the amount of annual export is naturally vague and uncertain so it is better defined as a fuzzy number. Therefore the exported coal, cement and clinker for the entire year must be allocated to each month and each exporting means (railway wagons, lorries, cargo ships etc) must meet the requirements of a stable safe lowcost supply. The objective function to model this must provide minimum cost and also include transportation cost by wagon and lorry. In this paper we have developed a model which combines the fuzzy multi-objective programming and multi-index transportation problem to solve an actual case for coal, cement and clinker export by cement industries. This model not only satisfies more of the actual requirements of the integral system but is also more flexible than conventional transportation problems.

Further more it can offer more information to the decision maker for reference, and then it can raise the quality for decision-making.
The fuzzy multi-objective multi-index transportation problem model is presented in this paper. Results and matter for proposed discussion is given. Finally conclusive remarks are made.