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MULTI-OBJECTIVE BUDGET ALLOCATION FOR SAFE AND SUSTAINABLE RADIOACTIVE WASTE MANAGEMENT

Strategies for effective allocation of budgetary expenditure to run radioactive waste management programs are crucial for supporting a safe and sustainable environment. In this study, we consider budgetary expenditure associated with the planning, treatment, packing, storage, and disposal of radioactive waste, focusing on ensuring a safe and sustainable environment. A multi-objective goal programming model is proposed and budgetary objectives are optimized hierarchically in this model. The model seeks to minimize the deviation variables and the objective function; subject to the budgetary goal constraints on planning, treatment, packing, storage, and disposal stages. The sum of deviations is minimized so that the actual expenditure for ensuring the safety and sustainability of radioactive waste management meets the targeted expenditure. Using the simplex method, an analytical solution is obtained and a numerical example is presented for illustration; demonstrating the overachievement/underachievement of budgetary expenditure toward the safety and sustainability of radioactive waste management. The model provides feasible results, considering the contradictory nature of budgetary priorities for executing radioactive waste management tasks. The proposed model can be cost-effective; where budgetary expenditure towards safety and sustainability can be prioritized; if necessary. This however depends upon the budgetary goals and priorities toward safety and sustainability in line with radioactive waste management programs.

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