In Sub-Saharan Africa, annual weather patterns cause recurrent shocks which make the population vulnerable to food insecurity. In some regions, seasonal droughts create regular food shortages that are mitigated through sustained food aid. The objective of this study is to design an effective last-mile food aid distribution network in such a context. It is based on the food aid distribution problem arising in the region of Garissa in Kenya, but the methodology that it introduces is of general applicability in humanitarian logistics. We present a location model to determine a set of distribution centers from which the food is directly distributed to the beneficiaries. Our model considers the welfare of all stakeholders involved in this regional response system: the World Food Programme, the Kenya Red Cross, and the beneficiaries. We describe how need assessment and population data were combined to determine the food distribution requirements. We also show how GIS data describing the road network was used to establish a set of potential distribution centers and to evaluate transportation costs. In addition to the results obtained by solving our primary model, we present variants of the basic covering model and several comparative analyses to illustrate the trade-offs between the objectives of the different stakeholders. Finally, future research directions are presented and discussed.

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